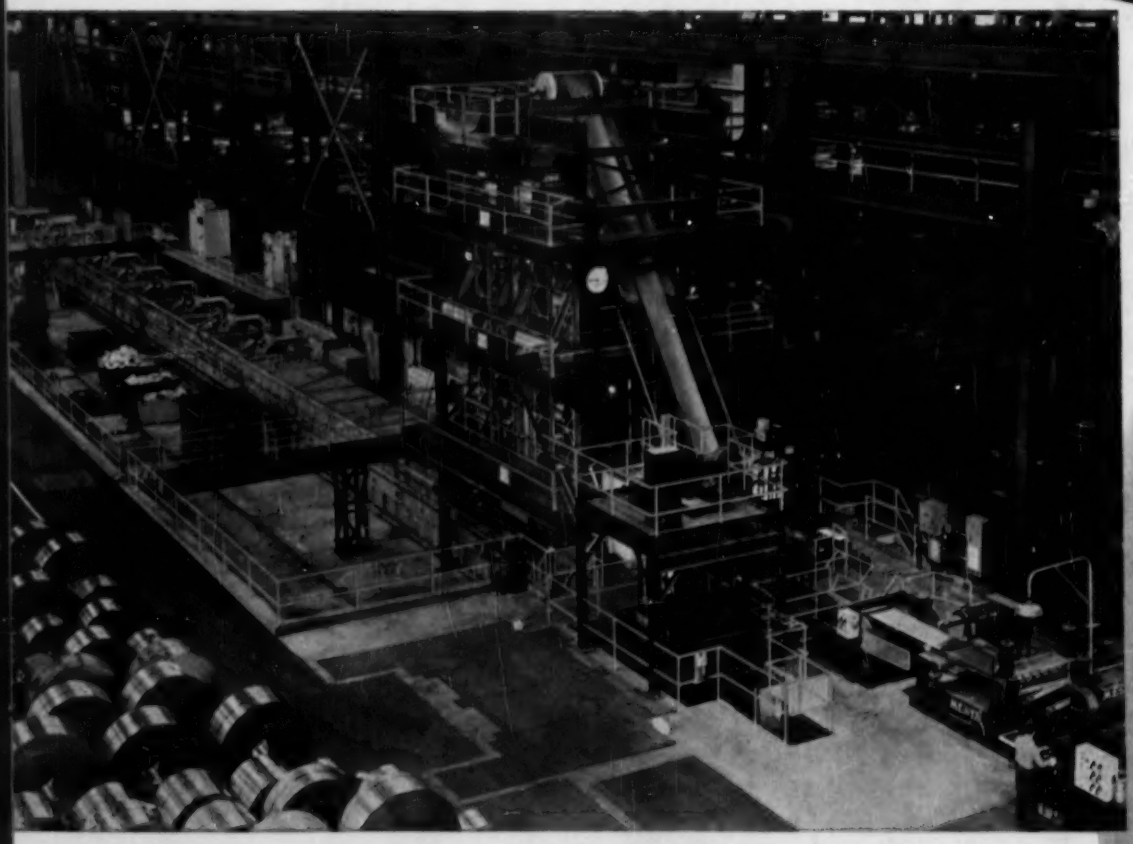
A Chilton Publication

The Iron Age

100th ANNUAL REVIEW AND FORECAST ISSUE • JANUARY 6, 1955

Continuous galvanizing lines

Designed and Built by MESTA



Mesta 48" Continuous Galvanizing Line

Designers and Builders of Complete Steel Plants

MESTA MACHINE COMPANY

PITTSBURGH, PENNSYLVANIA

SANDERS

NUT SETTERS

WIRE BRUSHES

GRINDERS

SCREW DRIVERS

SCALING HAMMERS

Try these

lightweight . . . speedy

PORTABLE TOOLS

DRILLS

BUFFERS

CHIPPERS

- Produced in the industry's most modern, air-conditioned plant to give you *top precision.*
- Gives you advanced features for *faster production, easier handling.*
- Backed by Rotor Tool's 25-year reputation for applying the *right tool for your job.*

Ask for a free demonstration of any of these tools.

MIDGET DRILLS

SANDING MACHINES

DIE GRINDERS

See how they can cut your costs!

RAMMERS

ANGLE DRILLS

VERTICALS

SPECIAL BULLETINS ON ALL TOOLS ON REQUEST

MIDGET GRINDERS

STONE GRINDERS

IMPACT WRENCHES

MIDGET GRINDERS

EXTENSION GRINDERS

CONE GRINDERS

GRINDERS

AIR

HIGH CYCLE

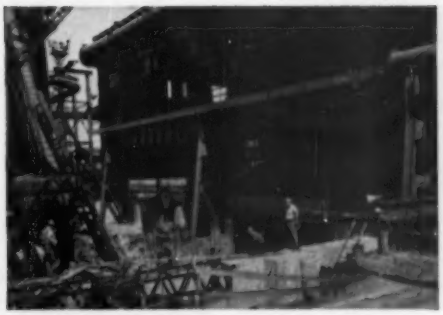
THE ROTOR TOOL CO.

CLEVELAND, OHIO

UNBIASED ANALYSIS OF PORTABLE TOOL PROBLEMS

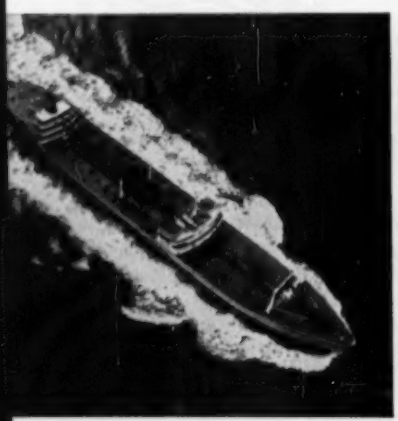
Some Bethlehem Steel Highlights of 1954

WORLD CHAMPION—In the month of May, blast furnace "J" at Bethlehem Steel's Sparrows Point plant established a new world record by producing 61,424 tons of pig iron, amounting to a daily average of 1981 tons. This record beat by nearly 5000 tons the former production record, held by furnace "H" at Sparrows Point.



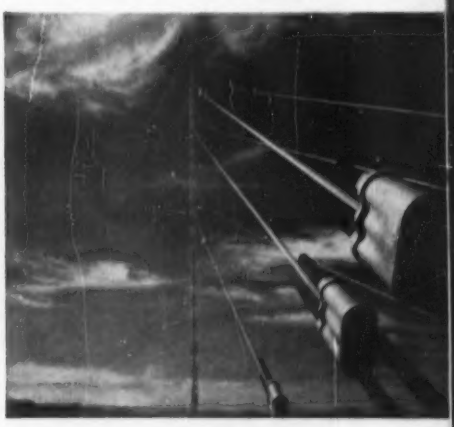
LARGER STRUCTURAL MILLS—The year saw continuing progress in the program to modernize and enlarge the structural mills of the Saucon division of the Bethlehem, Pa., plant, where wide-flange structural shapes were first rolled in this country, nearly fifty years ago. The improvements now under way will increase the capacity of the structural mills at Bethlehem by 50 percent, to 210,000 tons a month.

MORE ORE—At the year's end the new iron-ore project at Marmora, Ontario, Canada, was nearing production, with removal of the 100 ft capping of limestone nearly completed. At the Grace Mine, in Berks County, Pennsylvania, the sinking of shafts continued through the year, with the production of iron ore expected to start in late 1957.

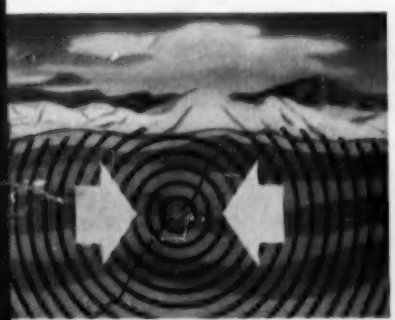


TANKER QUEEN—Early in the year the tanker World Glory, largest commercial vessel built in this country next to the liner United States, was launched at the Quincy, Mass., yard. The World Glory can carry 16½ million gallons of oil—the equivalent of 20 trains of 100 tank cars each, or a caravan of tank trucks 30 miles long.

HIGH-LEVEL BRIDGE—As 1954 closed Bethlehem had erected a large portion of the steelwork for the High-Level bridge extending for more than a mile along the Lake Erie waterfront at Buffalo. Much of the 11,500 tons of steelwork was rolled at Bethlehem's Lackawanna plant and fabricated at our Buffalo works. The High-Level bridge will connect with the Niagara section of the New York Thruway.



TALLEST MAN-MADE STRUCTURE—This steel needle is the new tower of Station KWTV at Oklahoma City, which measures 1572 ft from the ground to the tip of its soaring antenna. The tower is braced by 24 guy cables of Bethlehem strand, made at the Williamsport plant, totalling over 5 miles in length and 100 tons in weight.



"MEN, STEEL, AND EARTHQUAKES"—This new Bethlehem Pacific color movie explains how earthquakes originate and how construction of sound design, with the use of steel, has proved effective in resisting seismic forces. The film runs for 28 minutes, and is now available for showings before professional, educational and civic groups.

SAFETY IN STEELMAKING—Four Bethlehem plants—Bethlehem, Johnstown, Sparrows Point and Lackawanna—won first, second, third and fourth places among large steel plants in annual Metals Section Contest sponsored by National Safety Council. During the year the Johnstown plant ran from January 1 to May 5, more than four months, without a disabling injury to a single employee.

ROTOR DISCS FOR WIND TUNNEL—It took ingenuity to handle the tricky problems involved in forging these alloy steel rotor discs, 18 ft in diameter, 9 in. thick, and weighing 48 tons each. They are the largest-diameter forgings ever made by Bethlehem, noted for its production of forgings of unusual size.

BETHLEHEM STEEL

The Iron Age

Vol. 175, No. 1, January 6, 1955

100TH ANNUAL

Starred items are digested at right.

EDITORIAL

Survival or Progress? 7

ANNUAL REVIEW AND FORECAST

Newsfront 161
*Business Roundup 164
*Materials and Metals 168
*Production Processes 176
Report to Management 209
*Automotive Assembly Line 212
This Week in Washington 217
*West Coast Report 221
*Machine Tool High Spots 223

PRICE AND PRODUCTION DATA

*Steel Industry 340
Nonferrous Metals, Powders 348
Pig Iron, Iron Ore 351
Ferroalloys, Refractories 353
Iron and Steel Scrap 354

SPECIAL FEATURES

*Doing Business with Washington 225
*Industry Leaders Report on '55 234
*Trade Association Directory 292
Conventions and Meetings for 1955 312

MARKETS & PRICES

The Iron Age Summary—Steel Outlook 323
Steel Product Markets 324
Comparison of Prices 326
Iron and Steel Scrap Markets 326
Nonferrous Markets 330
Steel Prices 332

REGULAR DEPARTMENTS

Iron Age Salutes 279
New Equipment 279
Free Literature 284
Clearing House 366

INDEX OF ADVERTISERS 381

Copyright 1955, by Chilton Co. (Inc.)

THE IRON AGE, published every Thursday by CHILTON CO. (INC.), Chestnut & 56th Sts., Philadelphia 39, Pa. Entered as second class matter, Nov. 9, 1922, at the Post Office at Philadelphia under the act of March 3, 1879. Price to the metalworking industries only, or to people actively engaged therein, $5 for 1 year, $8 for 2 years in the United States, its territories and Canada. All others $15 for 1 year; other Western Hemisphere countries, $15; other Foreign Countries, $25 per year. Single copies, 50¢. Annual Review Issue, $2.00. Cables: "Ironage," N. Y.

Address mail to 100 E. 42 St., N. Y. 17, N. Y.

INDUSTRY SHIFTS BACK INTO HIGH GEAR — P. 163

You can hit the profit bullseye this year —but a rifle will be better than a shotgun. The Old Year showed that 100 pct operations aren't necessary to ring up profits unless you're using outmoded equipment, techniques, ideas. So get at the facts and sight your rifle at markets, products, methods, sales and customer preferences. Also, you'd better watch your inventories to make sure you don't get caught short.

METALS AND MATERIALS FORECAST FOR '55 — P. 168

Shipments and production of iron ore, coal and coke, scrap and refractories during 1954 are reviewed and forecasts of the supply and demand picture on these items are made for 1955. In the Metals and Alloys section, trends in the field of stainless and other alloys are noted. Also covered are news and market developments relating to titanium and other nonferrous metals such as copper, lead, zinc, aluminum and magnesium.

STAMPING AND FORGING: AUTOMATION GROWS—P. 1

New progress in the automation of presses, among the first production machines to be linked for automatic production, has been noted. Trend toward use of forging presses in place of forge hammers continues. Die costs, a factor affecting all press operators, are being studied more closely, especially in forging, stamping and forming operations and where production runs are short. Plastic die use is growing.

MACHINING: COLD FORMING METHODS GROW—P. 183

Industry took its first look several new pieces of equipment designed for cold forming last year. One machine cold forms cylindrical and conical parts over a spindle-mounted mandrel. Another "chipless" spline rolling machine is claimed to reduce the need for hobbing some parts. Both machines permit savings in materials. In other areas gains continued to be made in higher machining speeds, built-in gaging and automatic parts handling.

CASTING: PRODUCERS TRY NEW METHODS — P. 188

Future for producers of cast metal products, including foundrymen, steelmakers, diecasters and producers of investment castings, looks bright. New methods and new types of equipment are being tested in all branches of the industry. The results are reflected in products of higher quality, often produced at substantially lower cost. Wider use of automation will be made in most foundry operations. Much of the equipment needed for automation is already available.

REVIEW → FORECAST ISSUE

WELDING INDUSTRY OPTIMISTIC ABOUT '55 — P. 192

Forecasters are predicting a good year for the welding industry in 1955, based on a pickup in sales in the latter part of '54. Sights are set on the 1953 totals—one of the best years in peacetime. Trend in research is toward faster, more accurate equipment which users cannot afford to put aside much longer. In addition to the forecast, important developments of 1954 are reviewed: welding titanium, series-arc cladding, ultrasonic soldering and others.

SURVEY OF METAL FINISHING FOR 1954 — P. 196

In spite of nickel being in shorter supply than platers would like, consumers are getting better, longer-lasting finishes than they had been. This is attributed in large part to researchers who have come up with new products and processes, and have made refinements in existing techniques. Specialized setups, although expensive to install, are giving improved and more accurately controlled deposits at lower cost.

AUTO SHAKEOUT OVER, OPTIMISTIC ON '55 — P. 212

Mergers of independents were the top automotive developments of 1954 — a year that added more gray to executive heads and more stoop to management shoulders. Chrysler's battle to maintain its position in the Big Three—with history's biggest style change the major weapon—was another key action. GM's Curtice predicts 5.8 million cars for next year. But labor could throw all predictions out of kilter.

METALS WILL BOOM IN WEST DURING 1955 — P. 221

New peacetime record for steel consumption in the Far West is in the cards for 1955. It could run well over 6 million tons. And the western aluminum market is increasing in both size and diversification. Northwest will boost its 40-pct share of the nation's aluminum capacity and fabricating industry could be greatly expanded. But there's still a need for firm electric power expansion schedules to meet planned loads.

TOOL BUILDERS HAVE TRIPLE SALES HOPE — P. 223

Machine tool industry hopefully predicts 1955 will equal the $885 million 1954 total. But with November indexes dipping still lower, the present trend must first be reversed. Builders pin their hopes to heavier defense buying, more civilian sales, increased exports. Tool Show will illustrate 7 years of progress, is aimed at convincing metalworking management that obsolescence doesn't pay off.

INDUSTRY SPOKESMEN TELL WHAT'S AHEAD — P. 234

Top men of metal and metalworking industry associations were queried by The Iron Age on 1954 developments and outlook for 1955. Their responses are found in this special section. Most of them foresee an upswing in the year ahead. Frequently cited are expansion and modernization programs just completed which make plants and equipment most efficient ever. This obviously brightens the profit outlook.

KNOW YOUR TRADE GROUPS, CONTACT MEN — P. 292

Here's the executive's short cut to getting statistics and information from trade associations. The Trade Association Directory gives names of organizations, addresses and names of officers to contact. These men get around widely, really know their industries. And on page 312 you'll find when and where these groups will hold meetings and exhibitions in 1955. These are gatherings of key men, are well worth attending.

KEEP UP ON PRODUCTION, PRICE TRENDS — P. 339

Many executives keep The Iron Age Annual Issue on their desks all year just to have this 16-page statistical section within easy reach. It's considered an invaluable management reference book by metals and metalworking people. Whether you are seeking general information or unearthing data to help plan production, purchasing, marketing, this is your guidebook. Facts and figures are up-to-the-minute, reliable.

SPECIAL REPORT

HOW TO DO BUSINESS WITH THE GOVERNMENT—P. 225

Military purchasing in 1955 will be substantially higher than in 1954. Already industry's biggest customer, Uncle Sam will probably boost this buying by $2 billion in the fiscal year beginning July 1, 1955. Written by The Iron Age Washington Bureau and government officials, this feature tells you how to get a slice of the business. It tells how to get government loans, fast tax writeoffs, special aids to small business. Supplies of nickel, selenium, tantalum, mica, and other strategic metals remain far below stockpile goals. Government buying of these and other strategic metals may be sharply boosted during 1955. Special tax incentives are still available for some expansions.

EXPERIENCE from the very beginning of induction heating and melting is at your disposal when you call on Ajax.

It is leadership which began 38 years ago with the company's introduction of the first high frequency furnace for industrial use. Since then:

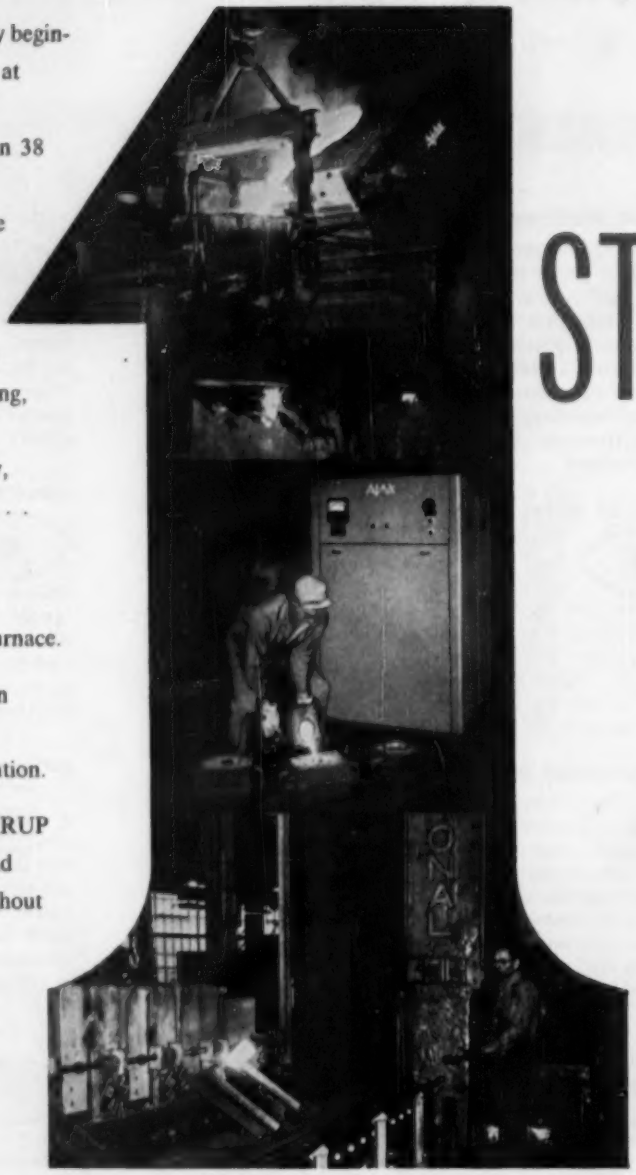
- Melting . . . forging . . . surface hardening (exploited under Ajax license) . . . vacuum melting . . . making, sintering and hot pressing carbides . . . graphitizing . . . and countless other low, dual and high frequency applications . . . *all were Ajax firsts.*

- Practically every new alloy has been developed in an AJAX-NORTHRUP furnace.

- Scores of large industries have grown around the nucleus of a simple AJAX-NORTHRUP laboratory installation.

- More kilowatts of AJAX-NORTHRUP induction equipment, both converter and motor-generator types, are in use throughout the world than any other.

Ajax engineers can show you how this *experience*, which has maintained leadership over the years, can bring you important day-to-day benefits . . . in even your toughest heating or melting application. Telephone or write today.



1ST

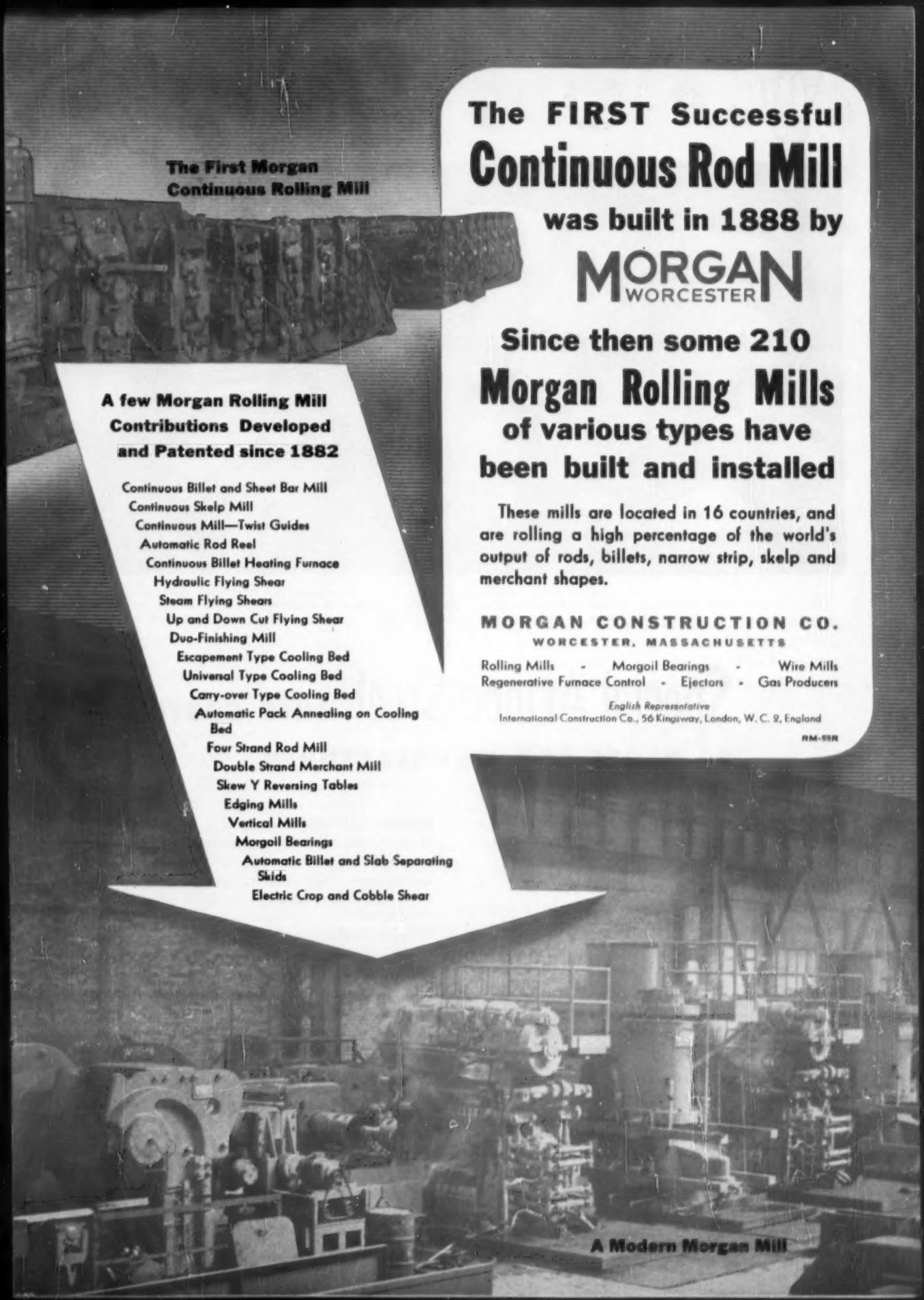
AJAX NORTHRUP SINCE 1916

INDUCTION HEATING-MELTING

AJAX ELECTROTHERMIC CORPORATION • TRENTON 5, NEW JERSEY

549

ASSOCIATED COMPANIES: AJAX ELECTRIC FURNACE CORPORATION • AJAX ELECTRIC COMPANY • AJAX ENGINEERING CORPORATION


The First Morgan Continuous Rolling Mill
A few Morgan Rolling Mill Contributions Developed and Patented since 1882
Continuous Billet and Sheet Bar Mill
Continuous Skelp Mill
Continuous Mill—Twist Guides
Automatic Rod Reel
Continuous Billet Heating Furnace
Hydraulic Flying Shear
Steam Flying Shears
Up and Down Cut Flying Shear
Duo-Finishing Mill
Escapement Type Cooling Bed
Universal Type Cooling Bed
Carry-over Type Cooling Bed
Automatic Pack Annealing on Cooling Bed
Four Strand Rod Mill
Double Strand Merchant Mill
Skew Y Reversing Tables
Edging Mills
Vertical Mills
Morgoil Bearings
Automatic Billet and Slab Separating Skids
Electric Crop and Cobble Shear
The FIRST Successful
Continuous Rod Mill
was built in 1888 by
MORGAN
WORCESTER
Since then some 210
Morgan Rolling Mills
of various types have been built and installed
These mills are located in 16 countries, and are rolling a high percentage of the world's output of rods, billets, narrow strip, skelp and merchant shapes.
MORGAN CONSTRUCTION CO.
WORCESTER, MASSACHUSETTS
Rolling Mills - Morgoil Bearings - Wire Mills
Regenerative Furnace Control - Ejectors - Gas Producers
English Representative
International Construction Co., 56 Kingsway, London, W. C. 2, England
RM-58R
A Modern Morgan Mill

These 25 parts of Armco ALUMINIZED STEEL are used by one company in eight different appliances. They are electric toasters, irons, corn poppers, coffee makers, waffle irons, sandwich grills, deep-fat fryers and percolators. Parts include element pans, bottoms, baffles, handle and terminal brackets, crumb tray, shield and base plate.

Special Armco Steel CUTS COSTS OF 25 PARTS FOR MANUFACTURER

Here's what the manufacturer of electrical appliances gained by changing interior parts of eight products from plated metal to Armco ALUMINIZED STEEL:

LOWER COSTS

Elimination of plating ended handling, cleaning and racking costs as well as actual plating costs. This produced savings of as much as 10 cents a part.

BETTER PRODUCTS TOO

Efficiency of all appliances was improved noticeably. The high *heat-reflectivity* of Armco ALUMINIZED STEEL keeps heat inside where it belongs. This makes appliances easier on kilowatts, means lower table-top temperatures.

IMPROVED APPEARANCE

Many of these internal parts are partly visible. When made of plated steel they showed ugly discoloration from high temperatures. The Armco ALUMINIZED STEEL parts show no discoloration because of their fine *heat resistance*.

SEE FOR YOURSELF

If you make products or parts that require a combination of heat- and corrosion-resistance or heat reflectivity, investigate this hot-dip aluminum coated steel. It is made in sheets and coils 13-through 28-gage and in widths up to 48 inches depending on gage. For further information write us for the booklet, "Armco ALUMINIZED STEEL."

ARMCO STEEL CORPORATION
785 CURTIS STREET, MIDDLETOWN, OHIO

ARMCO®

SHEFFIELD STEEL • ARMCO DRAINAGE & METAL PRODUCTS, INC. • THE ARMCO INTERNATIONAL CORPORATION

The IRON AGE

Editorial, Advertising and Circulation Offices, 100 E. 42nd St., N. Y. 17, N. Y. Oxford 7-3400

GEORGE T. HOOK, Publisher

TOM C. CAMPBELL, Editor

EDITORIAL STAFF

Managing Editor G. F. Sullivan
News-Markets Editor W. V. Packard
Technical Editor E. C. Beaudet
Asst. Technical Editor W. G. Patton
Machinery Editor E. J. Egan, Jr.
Metal Finishing Editor J. J. Obrzut
Metallurgical Editor W. D. Latiano
Asst. Markets Editor R. L. Hatschek
Asst. News Editor E. C. Kellogg
Associate Editors: H. W. Van Camp, W. B. Olson, G. G. Carr, J. R. Whipple; *Art Director:* J. A. Degen; *Regional Editors:* K. W. Bennett, Chicago; R. D. Raddant, Detroit; T. M. Rohan, Cleveland; J. B. Delaney, Pittsburgh; R. R. Kay, Los Angeles; G. H. Baker, R. M. Stroupe, N. R. Regelmbal, Washington; *Editorial Assistants:* L. Brass, M. Perrone, C. M. Markart; *Correspondents:* F. L. Allen, Birmingham; N. Levenson, Boston; R. M. Edmonds, St. Louis; J. Miller, San Francisco; James Douglas, Seattle; F. Sanderson, Toronto; F. H. Harley, London, England; Chilton Editorial Board: Paul Wooton, Washington representative.

WASHINGTON EDITORIAL OFFICE

Washington 4.....National Press Bldg.

BUSINESS STAFF

Production Manager B. H. Hayes
Director of Research Oliver Johnson
Circulation Mgr. W. M. Coffey
Promotion Manager J. A. Crites
Asst. Research Dir. Wm. Laimbeer

REGIONAL BUSINESS MANAGERS

Chicago 2.....S. J. Smith, T. H. Barry
1 N. LaSalle St. Franklin 2-0203
Cleveland 14.....Robert W. Watts
1016 Nat'l City Bk. Bldg. Main 1-2263
Columbus 15, Ohio.... Harry G. Mumm
LeVeque-Lincoln Tower Capitol 1-3764
Detroit 2..... Peirce Lewis
103 Pallister Ave. Trinity 1-3120
Los Angeles 28.....R. Raymond Kay
2420 Cheremoya Ave. Holy'd 7-0741
New York 17...C. H. Ober, C. T. Post
100 E. 42nd St. Oxford 7-3400
Philadelphia 39.....B. L. Herman
56th & Chestnut Sts. Granite 4-5600
Pittsburgh 22.....J. M. Spackman
1502 Park Bldg. Atlantic 1-1832
W. Hartford 7.....Paul Bachman
62 LaSalle Rd. Adams 2-0486
England .....Harry Becker
111 Thorley Lane, Timperley, Cheshire

One of the Publications Owned and Published by Chilton Co., Inc., Chestnut & 56th Sts., Philadelphia 39, Pa.

OFFICERS AND DIRECTORS

JOS. S. HILDRETH, President

Vice-Presidents: P. M. Fahrendorf, G. C. Buzby, Harry V. Duffy; William H. Vallar, Treasurer; John Blair Moffett, Secretary; George T. Hook, Maurice E. Cox, Tom C. Campbell, Frank P. Tighe, L. V. Rowlands, Robert E. McKenna, Irving E. Hand, Everit B. Terhune, Jr., Directors.

Indexed in the Industrial Arts Index and the Engineering Index.

ABP NBP

Editorial:

Survival or Progress?

WE in metalworking beat the drums mightily for new products, new techniques, better products and fast replacement of inefficient machinery—new or old. That's the way it should be. But do we practice in our own plant what we want the other fellow to do?

A steel firm wants its customers to have the latest in machinery, in buildings and in a hundred and one other items. Does that firm have the same things in its plant? The machine tool builder beats his brains out telling people how to get costs down with the newest tools. Does he use them in his plant?

The answers to these questions—which apply to all firms—are not easy to find. But they do form the basis of what has to be your program for 1955—and for all the years to follow. No longer can you as an industrialist duck the messages in your own sales literature or advertising. What is good enough for your customers ought to be good enough for you.

Just to survive is not good business, nor is it safe. Many firms are just surviving today because they have the demand to bolster them up. But what will happen as more progressive companies continue to replace equipment and machinery as new and more efficient products appear on the market? We still have the profit motive and we still have to sell. We can't afford the wrong tools today.

There are three big reasons why industrial firms must keep up to date on tools, machines, techniques and sales methods: Continuing higher wage costs, social security, and global defense.

Industry bears the brunt of these expenses. If we are to increase our standard of living as an effective answer to the Reds we must progress industrially in the midst of a cold war. Not to do so means that we are only holding our own. That's not enough.

The stakes in this struggle are high. Freedom or slavery—there will be no alternative in the end. Industry has a greater responsibility in this battle than is generally realized either outside or inside its ranks.

Only you can answer the question, "Do I practice what I preach?" If you don't, now is the time to start—if you are to do more than just survive.

Tom Campbell

EDITOR

"FINEST CHAIN *for* TOUGHEST DRIVES"

WAYNE-INVADER PUMPS RELY ON ATLAS

...for long life under hard service

Invader Rotary Pumps are workhorses for all industries. That's why the Schirmer Division of the Wayne Pump Company equips all chain-drive pumps, like the oil refining unit above, with Atlas Roller Chain and Precision-Matched Sprockets. They say Atlas is the finest chain for the toughest drives.

Long life starts with Atlas specially selected steels. Plates, pins, and bushings are super-toughened by heat-treating and the "Ni-Carb" process which give a stronger, better operating chain over longer periods. Rollers, pins and bushings are "Micro-Finished" to exact tolerances. Sprockets heat treated for toughness are precision-ground for smooth, quiet operation with Atlas Chain.

Atlas Chain and Atlas Sprockets are carefully pre-tested at more than 30 points in production to assure you of chain unsurpassed in quality and performance. Whatever your chain or sprocket need call on Atlas. Write for Atlas Chain and Sprocket Handbook ARC-54.

ATLAS CHAIN & MANUFACTURING COMPANY
DOYLESTOWN, PA.

ATLAS

ROLLER CHAIN AND SPROCKETS

dear editor: *letters from readers*

Tubular Parts

Sir:

We are interested in obtaining more information regarding the method mentioned in the paragraph entitled "heavy end strengthens tubular parts" which appears on the newsfront page of the Nov. 18 issue. *J. D. Judge, President, Tube Reducing Corp., Wallington, N. J.*

Further information on this method may be obtained by writing to Thompson Products, Inc., West Coast Plant, Bell, Calif.—Ed.

Ceramic Fan

Sir:

Please advise if there is any more information available regarding the subject of a ceramic fan for high temperature use other than that mentioned in your Nov. 18 issue under newsfront. *R. L. Baker, Asst. Purchasing Agent, The Air Preheater Corp., Wellsville, N. Y.*

Further information on the ceramic fan may be obtained by contacting Mr. Harold Ipsen, Ipsenlab, Rockford, Ill.—Ed.

Spacer Blocks

Sir:

Please send us further information regarding investment cast aluminum spacer blocks as described in the Dec. 9 issue on the newsfront page. *L. E. Chaundy, Jr., National Precision Casting Corp., Clifton Heights, Pa.*

More details may be obtained by contacting the Glenn L. Martin Co., Baltimore, Md.—Ed.

Thank You

Sir:

We wish to congratulate Mr. A. E. Durkin for his very fine article, "How to Control Hydrogen Embrittlement in 12-Chrome Steels" which appeared in your Dec. 9 issue.

We would be most interested in obtaining five tear sheets of this article. *Andrew Van Echo, Joslyn Stainless Steels, Fort Wayne, Ind.*

Steel Capacities Chart

Sir:

Periodically you publish a threefold page showing official steel industry capacities. My latest sheet is dated March 13, 1952 and I would very much appreciate receiving two reprints of the current summary you have available. *N. A. Birch, Vice-President, Operations, National Bearing Div., American Brake Shoe Co., St. Louis.*

Dump Trucks

Sir:

If possible, we would very much like to have 20 tear sheets of the article entitled "Dump Trucks" on p. 52 of your Nov. 25 issue. We would like these for our files and to pass along to our customers. *W. C. Weltman, Engineer, Automotive Section, Sales Development Div., Aluminum Co. of America, New Kensington, Pa.*

Conveyor System

Sir:

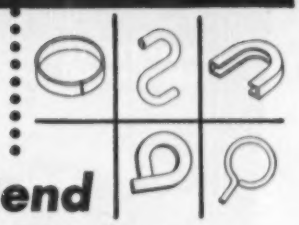
We would appreciate receiving five tear sheets of the article "Highly Developed Conveyor System Combines Versatility With Maximum Handling Efficiency" in the Oct. 7 issue. *Ernest Olsen, The Oliver Corp., Springfield, Ohio.*

Save Heirs Money

Sir:

I have found your series of articles with reference to estate planning to be very educational and interesting.

Would you please send me a copy of the entire series. *E. E. Braun, Central Foundry Div., General Motors Corp., Saginaw, Mich.*



Bend a Variety of Materials

Accurately, Easily, Quickly with a DI-ACRO* BENDER

Simple and complex bends can be formed and duplicated in many ductile materials with a versatile Di-Acro Bender. Bending capacity of the five hand operated models ranges from 1/16" wire to 1" round mild steel bar. Many accessories are available for bending various materials and shapes. The Di-Acro Bender can be delivered completely tooled for most forming requirements in solid materials and tubing.

*Pronounced Die-ack-ro

DI-ACRO HYDRA-POWER BENDER

A universal hydraulically operated bending machine that is equally as flexible as hand operated machine. Di-Acro Hydra-Power Benders are especially designed for those long runs and heavy bending operations which are impractical for manually operated equipment.

Creators of "DIE-LESS DUPLICATING"

WANT MORE INFORMATION?
Send for New 32-Page Catalog

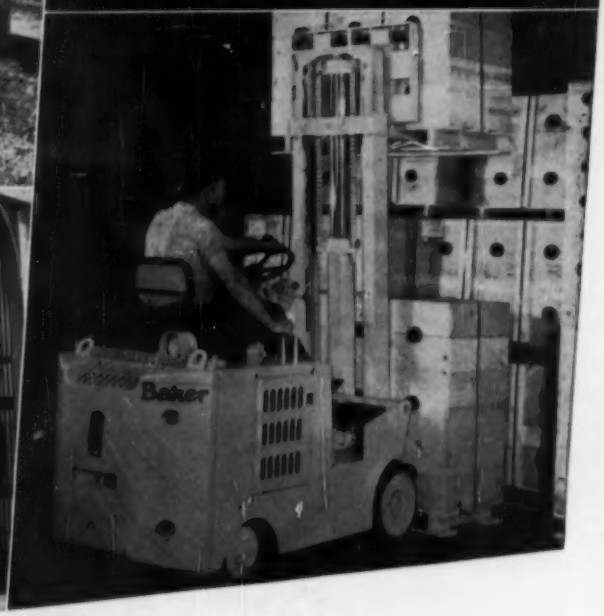
Gives complete details on hand and power operated Di-Acro Benders, Brakes, Notchers, Punch Presses, Rod Parters, Rollers and Shears. Send for your copy today—there's no obligation.

O'NEIL-IRWIN MFG. CO.
302 8th Avenue
Lake City, Minn.

di-acro PRECISION METALWORKING MACHINES

and Now—

BAKER TYPE FG STRAIGHT GAS



NOW— Baker has ALL THREE types of GAS FORK TRUCKS

● To its economy-priced, pneumatic-tired YARDLOADER and its premium GAS-O-MATIC line, Baker now adds the commercial version of its STRAIGHT-GAS fork truck—manufactured in quantity for the U. S. Armed Forces during the last two years. For ordinary fork truck applications this new Baker Type FG features low initial cost, low maintenance, speed and economy. It is built to the same high engineering standards that have characterized Baker electric trucks for over 35 years. Available in most wanted capacities.

If you need a fork truck for rugged outdoor-indoor handling—on rough floor or ground conditions—or where long hauls are involved, you can save up to $1,000 initial cost by buying the speedy Baker EY-40 "YARDLOADER"—pneumatic-tired, heavy-duty, gas-powered—the lowest priced fork truck in the 2-ton class.

Outstanding gas truck in the Baker line is the GAS-O-MATIC. The gas engine drives the exclusive GAS-O-MATIC generator to supply power to the Baker electric motor—giving electric truck performance and operating economy at premium gas truck initial cost. Gas consumption for normal service of 2-ton model about ½ gallons per hour. Capacities 4,000 to 6,000 pounds.

Descriptive bulletins are available. Write the Baker-Raulang Company, 1227 West 80th Street, Cleveland 2, Ohio.

Baker.
industrial trucks

fatigue cracks

by William M. Coffey

The Annual

The Christmas and New Year season must be awfully nice—for some people. Some people can forget for just a little while their cares and worries and responsibilities and have a little fun. We've even heard about some people going to parties, dragging trees over the snow, singing under Yule logs and just having a real bang-up ole time going around with big smiles saying Merry Christmas to the bus drivers and the elevator boy and everybody. But not us, and certainly not our stalwart band of editors.

. . . for this is the season for *The Annual*, and you hold it right in your little hands. OOPS!, don't drop it. This encyclopedic-packed annual was started by our editorial team six months ago. It's been on everybody's mind ever since. You'll note the good, solid, authoritative and ever-useful statistics, facts and predictions to guide you through 1955. You'll find the usually brilliant year-end Production Roundup, Business Roundup, Trade Association Directory, 1955 Calendar of Events, West Coast Report, The Automotive Roundup, and the Washington Front. Our Washington Bureau in particular extended themselves this time with one of the most useful features you'll ever find—*How To Do Business with the Government*. Here's all the dope, the dope you can really use, on arms spending, loans, renegotiation, small business aids and all the rest.

But don't tarry here! Take a month off and go through the whole book. We're right proud to start our 100th Anniversary Year with an issue that's a complete handbook of metalworking facts and know-how.

Another job well done by your IRON AGE editors in action.

Art

The President, Chief, Manager and Director of our Circulation Billing Department, Miss Phyllis Starr, is an artist. She brought one of her latest works in yesterday. It was a cross between a black and white checkerboard and a head, the last one of its kind we remember seeing in the Army Medical Museum. Neither the checkerboard nor the head were recognizable. Phyllis is a *modern artiste*. Queried as to the sense of the thing, Miss Van Gogh Starr turned poetess:

'Tis A Puzzlement
or

(Don't Clean Your Specs, Mother, the Spots Are on the Canvas.)

Did you ever wander through the Museum of Modern Art
And wonder if you were dull or smart
Because the meanings of the paintings escaped you?
And did you ever think that if an artist did your portrait
It would look like he just aped you?
I sometimes wonder if they're really serious
Or suffering from tremens delerious.
It seems to me, that an artist should make a horse look like a horse.
(Present company excluded, of course.)

Puzzlers

A railroad allows a passenger to carry a certain number of pounds of baggage without charge, and charges at a certain rate for all above that amount. Two passengers together have 350 lb of baggage, and are charged 25¢ and 50¢, respectively, for the excess. If the baggage had belonged to one of them, he would have been charged $1.25. How much baggage is one passenger allowed without charge? What rate is charged for the excess baggage? How many pounds did each passenger have?

what you should know about

METAL PARTS PROCESSING MACHINERY

metalwash CONTINUOUS SPRAY PICKLERS

mail coupon for free booklet:
WHAT YOU SHOULD KNOW ABOUT CONTINUOUS SPRAY PICKLING

metalwash AUTOMATIC PARTS WASHERS

mail coupon for free booklet:
WHAT YOU SHOULD KNOW ABOUT METAL CLEANING

metalwash PHOSPHATIZING MACHINES

mail coupon for free booklet:
PHOSPHATE COATING COMES OF AGE

Metalwash Machinery Corporation
920 North Ave., Elizabeth 4, N. J.
Please send literature checked below:

☐ PICKLING ☐ PHOSPHATIZING
☐ WASHING ☐ FULL-LINE CATALOG

NAME.....
FIRM.....
ADDRESS.....
CITY.....ZONE.....STATE.....

HUB of production

This is an R. D. Wood 3,000-ton high-speed forging and cogging hydraulic press. It is used for a variety of work—forming, forcing, upsetting, impact extrusion. It handles aluminum, bronze, magnesium, steel, brass, and other metals. It is an essential part of accurate mass metal component production—and is representative only of a wide range of hydraulic presses for all metalworking operations. Write for additional information on this and other hydraulic presses.

HYDRAULIC PRESSES AND VALVES FOR EVERY PURPOSE
ACCUMULATORS
ALLEVIATORS
INTENSIFIERS

R. D. WOOD COMPANY
PUBLIC LEDGER BUILDING, PHILADELPHIA 5, PA.
Established 1803

WOOD

dates to remember

JANUARY

SOCIETY OF AUTOMOTIVE ENGINEERS—Golden Anniversary annual meeting and Engineering display, Jan. 10-14, Sheraton-Cadillac Hotel and Hotel Statler, Detroit. Society headquarters are at 29 W. 39th St., New York.

NATIONAL CONSTRUCTORS ASSN.—Annual meeting, Jan. 11-13, Plaza Hotel, New York. Association headquarters are at 50 E. 41st St., New York.

AMERICAN SUPPLY & MACHINERY MANUFACTURERS ASSN., INC.—Regional meeting, Jan. 12-15, Biloxi, Miss. Association headquarters are at 2130 Keith Bldg., Cleveland.

EXPOSITIONS

NATIONAL ASSN. OF CORROSION ENGINEERS—Annual meeting and Show, Mar. 7-11, Palmer House, Chicago. Association headquarters are at 1061 M & M Bldg., Houston.

AMERICAN SOCIETY FOR METALS—Western Metal Exposition and Congress, Mar. 28-Apr. 1, Pan Pacific Auditorium, Los Angeles. Society headquarters are at 7301 Euclid Ave., Cleveland.

STEEL SHIPPING CONTAINER INSTITUTE, INC.—Winter meeting, Jan. 19-20, Hampshire House, New York. Institute headquarters are at 600 Fifth Ave., New York.

SOCIETY OF PLASTICS ENGINEERS, INC.—Annual national technical conference, Jan. 19-21, Chalfont-Haddon Hall Hotel, Atlantic City, N. J. Society headquarters are at 513 Security Bank Bldg., Athens, Ohio.

CUTTING TOOL MANUFACTURERS ASSN.—Annual meeting, Jan. 20, Detroit Yacht Club, Detroit. Association headquarters are at 416 Penobscot Bldg., Detroit.

STEEL PLATE FABRICATORS ASSN.—Annual meeting, Jan. 20-21, Palmer House, Chicago. Association headquarters are at 79 West Monroe St., Chicago.

MALLEABLE FOUNDERS' SOCIETY—Semi-annual meeting, Jan. 21, Cleveland Hotel, Cleveland. Society headquarters are at Union Commerce Bldg., Cleveland.

INDUSTRIAL HEATING EQUIPMENT ASSN., INC.—Annual meeting, Jan. 24-25, Sheraton-Cadillac Hotel, Detroit. Association headquarters are at 412 Fifth St., N. W., Washington.

PLANT MAINTENANCE & ENGINEERING SHOW—Jan. 24-27, International Amphitheatre, Chicago. Show Management: Clapp & Poliak, Inc., New York.

TRUCK TRAILER MANUFACTURERS ASSN., INC.—Annual convention, Jan. 27-29, Boca Raton, Fla. Association headquarters are at Room 710 Albee Bldg., Washington.

FEBRUARY

CUTTING TOOL MANUFACTURERS ASSN.—Annual meeting, Feb. 2, Detroit Yacht Club, Detroit. Association headquarters are at 416 Penobscot Bldg., Detroit.

AMERICAN INSTITUTE OF MINING & METALLURGICAL ENGINEERS—Annual meeting, Feb. 14-17, Conrad Hilton Hotel, Chicago. Institute headquarters are at 29 W. 39th St., New York.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS—Founding Anniversary meeting, Feb. 16, New York. Society headquarters are at 29 W. 39th St., New York.

DROP FORGING ASSN.—Winter Industry meeting, Feb. 17-18, Statler Hotel, New York. Association headquarters are at 605 Hanna Bldg., Cleveland.

FIRE!

Unless you get the jump on fire the minute it starts, you stand a good chance of kissing your business good-bye.

That's why it's so important to have a Kidde portable extinguisher near *every* fire hazard in your plant.

Protect motors, electrical equipment, flammable liquids and machinery with Kidde portables. Then, when fire strikes, you're ready for it.

Just grab a Kidde CO_2 or dry chemical portable, aim the horn, pull the trigger, and—Whoosh! No more fire!

Your *next* fire could be your *last*... Contact Kidde today!

The words 'Kidde', 'Lux', 'Lux-O-Matic', 'Fyre-Freez' and the Kidde seal are trademarks of Walter Kidde & Company, Inc.

Kidde

Walter Kidde & Company, Inc.
149 Main St., Belleville 9, N. J.

Walter Kidde & Company of Canada, Ltd., Montreal—Toronto

LANDIS THREAD
LANDIS
LANDIS MACHINE CO
THE WORLD'S LARGEST MANUFACTURERS OF THREADING EQUIPMENT-CUTTING-TAPPING-GRINDING-ROLLING

ROLLING MACHINE

NOW *Available!*

LANDIS is now offering a revolutionary new machine for producing threads, not available anywhere else in the Western Hemisphere—the LANHYROL Thread Rolling Machine.

The LANHYROL produces strong, accurate threads of excellent finish by the chipless, cold-forming process—and offers unequalled output, flexibility, and range coverage:

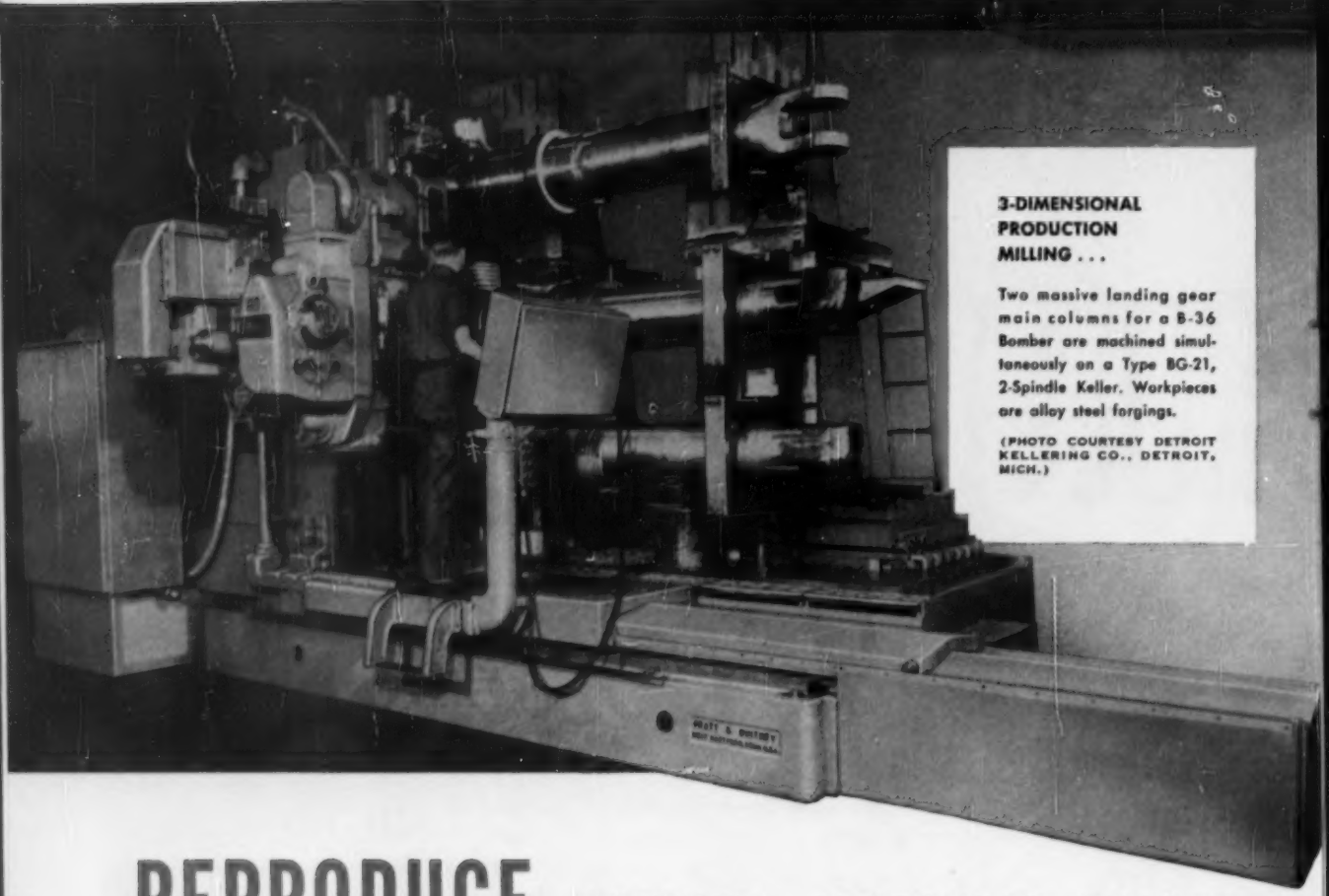
- It will produce left- and right-hand threads of all types (except square), including UNC, UNF, Acme, worm, and many special forms.
- It will thread all diameters from 3/16" to 3".
- Threads are rolled by four distinct methods—Infeed, Thrufeed, Continuous, and Reciprocal. The rolling method used is determined by the length and type of thread and the design and hardness of the workpiece.
- Threads can be produced to Class 2 and 3 fit by Continuous Rolling, and to Class 4 fit by Infeed, Thrufeed, and Reciprocal Rolling.
- Production rates are high. They vary with the individual operation, but for example—600 pieces per hour, rolling ⅞" 9 pitch UNC threads 1¼" long on 4140 steel of 29C Rockwell hardness, using Infeed Rolling with semi-automatic operation and manual loading.
- Hopper equipment, automatic operation, and auxiliary equipment for special threads is available.

The LANHYROL Thread Rolling Machine is an important new addition to The Landis Line of Threading Equipment developed by more than 50 years of research and experiment. Additional information on request—please send specifications and ask for Bulletin *E-60.*

LANDIS *Machine* COMPANY

WAYNESBORO • PENNSYLVANIA • U. S. A.

417-E



3-DIMENSIONAL PRODUCTION MILLING . . .

Two massive landing gear main columns for a B-36 Bomber are machined simultaneously on a Type BG-21, 2-Spindle Keller. Workpieces are alloy steel forgings.

(PHOTO COURTESY DETROIT KELLERING CO., DETROIT, MICH.)

REPRODUCE COMPLEX, IRREGULAR SHAPES

METAL FORMING AND DRAWING DIES • FORGING DIES • PLASTIC MOLDS
RUBBER MOLDS • DIE CASTING DIES • METAL PATTERNS • CAMS
PROTOTYPE WORK • PRODUCTION MILLING • AND MANY OTHER JOBS

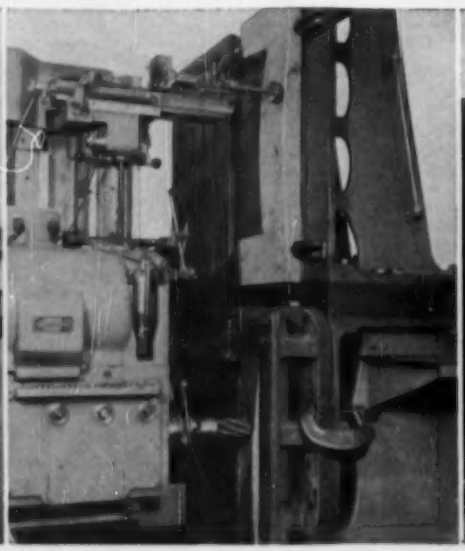
MODERNIZE with PRATT & WHITNEY REPLACE FOR PROFIT

faster and more economically

DIE CASTING DIE . . .

to produce metal shrouds for 25 hp outboard motors. Cavity was deep, intricate, and involved heavy metal removal. Cavity was completely Kellered in only 219 hours on a BG-21 Keller.

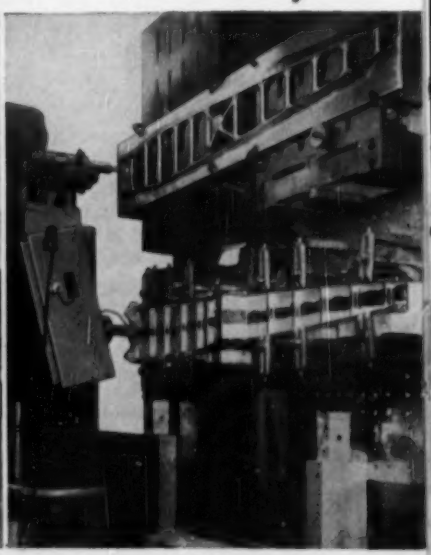
(PHOTO COURTESY ATOLS TOOL AND MOLD CORPORATION, CHICAGO, ILLINOIS)



DRAW DIE . . .

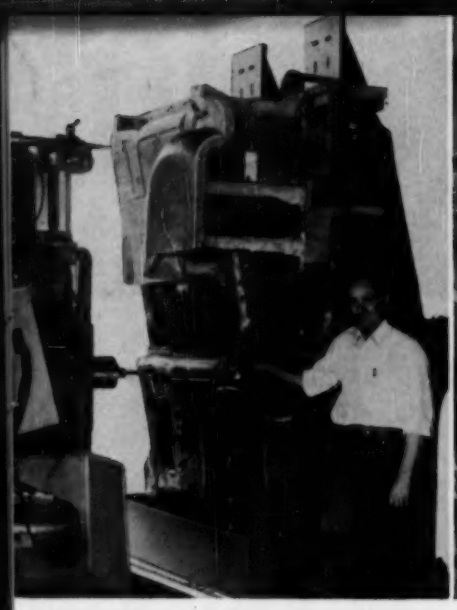
for a motor truck cab door, approximately 48" x 70". The complete job was produced quickly and economically on a Pratt & Whitney Type BG-21 Keller Machine.

(PHOTO COURTESY BUFFALO TOOL & DIE MFG. CO., BUFFALO, N.Y.)



PROFILE MILLING . . .

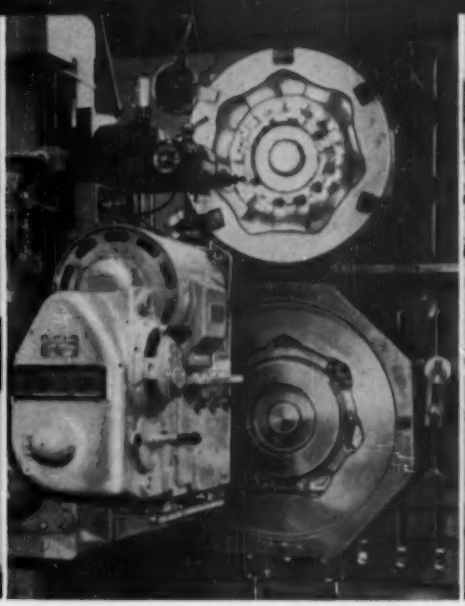
an aluminum aircraft wing spar is fast and easy with "Kellering." The only template usually required for this type of work is a simple, 2-dimensional template.



BODY FORMING DIE . . .

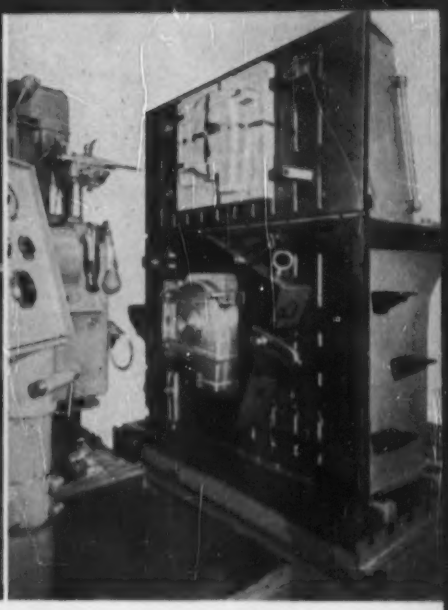
machined by full 3-dimensional tracer-controlled milling from an intricate plaster model. The finished die will be used to form a complete section for the famous Fisher Bodies.

(PHOTO COURTESY SONITH PATTERN WORKS, INDIANAPOLIS, IND.)



FORGING DIE . . .

Using a cement master cast from a wooden pattern, the Keller BG-21 duplicates the complex cavity in an aircraft engine forging die. "Kellering" accuracy on this type of work greatly reduces hand finishing cost.



IMPRESSION DIE . . .

18" x 24" x 4" to produce covers for an 18" rotary lawn mower (trade name "Lawn Boy"). Working from a plaster model, a Type BG-21 Keller Machine does the job rapidly, accurately.

(PHOTO COURTESY JOHNSON MOTORS DIV., OUTBOARD, MARINE & MFG. CO., WAUKEGAN, ILL.)

with PRATT & WHITNEY KELLER TYPE BG-21 Automatic Tracer-Controlled Milling MACHINES

OBTAINABLE IN CAPACITIES FROM: 4 FT. HORIZONTAL X 2½ FT. VERTICAL . . . UP TO 10 FT. HORIZONTAL X 4 FT. VERTICAL.

P&W KELLER Machines are powerful, horizontal spindle milling machines with electric tracer control. They reproduce the shape of any 2-dimensional template or 3-dimensional model accurately and economically; total machining time is much less than that required by other methods. Complicated shapes are duplicated as easily and efficiently as simple ones. The initial job is done more economically, and additional duplicates are produced at a fraction of the usual cost and time.

Keller Machines are designed and built *specifically* for tracer-controlled milling . . . not just "adapted" . . . and can take on a wide variety of jobs without requiring major adaptation by costly attachments. They are rugged machines that will operate dependably and accurately year after year without expensive maintenance.

IN ADDITION TO THE NEW TYPE BG-21, LARGER AND SMALLER SIZES OF KELLER MACHINES CAN BE FURNISHED.

WRITE NOW FOR COMPLETE INFORMATION

See how P&W Keller Machines can help reduce machining time and costs and increase your profits. Fill in the attached coupon and mail for your free copy of Circular No. 565 that completely describes the versatile new Type BG-21 Keller.

PRATT & WHITNEY
DIVISION NILES-BEMENT-POND COMPANY
WEST HARTFORD 1, CONNECTICUT, U. S. A.
SINCE 1860

First Choice for Accuracy

BRANCH OFFICES . . . BIRMINGHAM • BOSTON • CHICAGO • CINCINNATI • CLEVELAND • DALLAS (The Stanco Co.) • DETROIT • HOUSTON (The Stanco Co.) • LOS ANGELES • NEW YORK • PHILADELPHIA • PITTSBURGH • ROCHESTER • SAN FRANCISCO • ST. LOUIS • EXPORT DEPT., WEST HARTFORD

MACHINE TOOLS • CUTTING TOOLS • GAGES

PRATT & WHITNEY Division Niles-Bement-Pond Co.
10 Charter Oak Blvd., West Hartford 1, Conn.

PLEASE SEND MY FREE COPY OF CIRCULAR NO. 565.

*NAME*_____

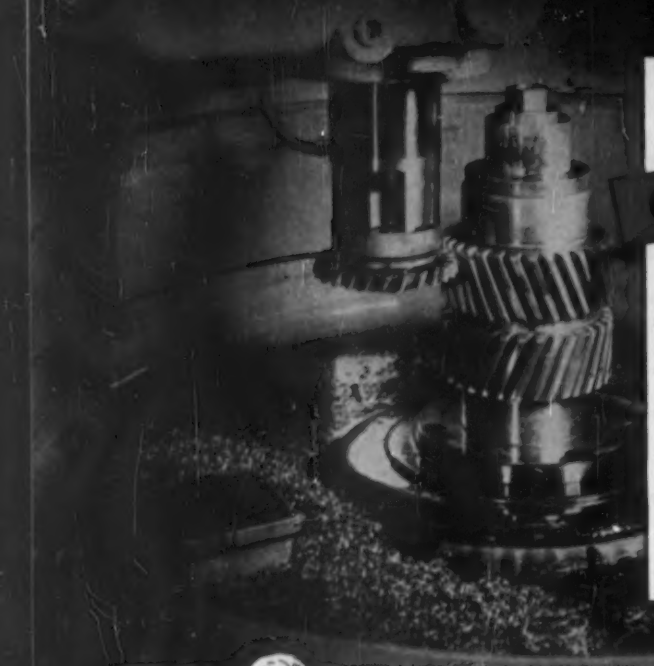
*POSITION*_____

*COMPANY*_____

*CO. ADDRESS*_____

*CITY*_____ *ZONE*_____ *STATE*_____

THE FELLOWS METHOD ... Machines and



	FROM 1/16" TO.....	
	3" FINE-PITCH	TYPE 4GS
Spur and Helical	both	both
External and Internal	yes	yes
Max. Pitch Diameter	3 inches	6 inches
Max. Diametral Pitch	40 Steel, 30 Brass	5/7 spur, 6 hel.
Max. Face Width	3/4" ext.	2"
Strokes per Min. Max.	2000	635

	No. 4 FINE PITCH	No. 8 "FULL-TOOL"	No. 11 INTERNAL
Spur and Helical	both	both	both
External and Internal	Ext. only	yes	Int. only
Max. Pitch Diameter	4 inches	8 inches	• • •
Max. Diametral Pitch	20	4	6
Max. Face Width	1 inch	2 1/2 inches	1 1/2" up to 10p 1" 12 to 16p
Max. Spread of Centers	12 inches	• •	—

Also 12", 18" and 24" machines for externals only

Spur and Helical
External and Internal
Max. Pitch Diameter

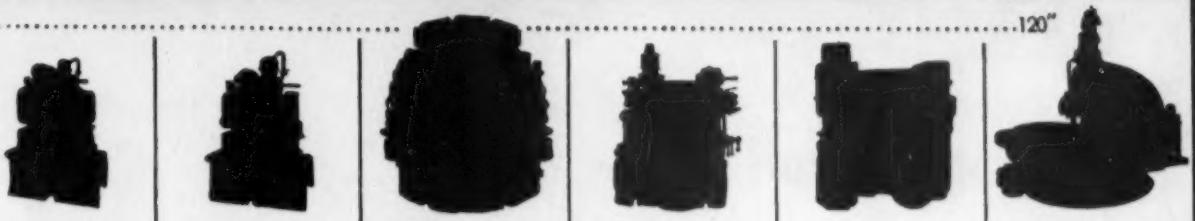
**Depends upon work-holding fixture ***Depends upon design of gear

THE *Fellows*

Head Office &

Branch Offices: 820 Fisher Bldg., Detroit 2, Michigan

Tools for Precision Gear Production



7-TYPE*	7A-TYPE	No. 10 ROTARY	6A-TYPE	36-TYPE	120-INCH
both	both	both	both	both	both
yes	yes	yes	yes	yes	yes
7" spur, 6 1/2" hel.	7" spur, 7" hel.	12 inches	18 inches	36 inches	120 inches
6 spur, 6/8 hel.	5/7 spur, 6 hel.	3/4 spur, 5/7 hel.	3/4 spur, 5/7 hel.	3 spur, 4/5 hel.	2 spur, 4 hel.
1 1/2" ext., 1" int.	2" ext., 2" int.	3" ext., 3" int.	5" ext., 3" int.	6" ext., 6" int.	8" ext., 8" int.
450	450	500	300	300	148

*Max. P. D. internal — 5 1/2"

No. 4 Fine-Pitch RED LINER	No. 8M RED LINER	No. 20M RED LINER	No. 12M Involute MEASURING INVOLUTE PROFILE CHECK	No. 12H LEAD MEASURING CHECKING LEAD CROWN & TAPER
FOR COMPOSITE CHECK				
both	both	both	both	both
yes	yes	yes	yes	yes
4 inches	***	18 inches	12 inches	12 inches

Nos. 24M Involute and 24H Lead Measuring Instruments with capacity of 24 inches

***Depends upon design of gear

Ask for Literature, available on all of the standard equipment shown above. In addition Fellows builds many special-purpose machines for production of gears and allied devices. A Fellows Representative will be glad to counsel with you on your particular problem. Get in touch with the nearest Fellows office.

GEAR SHAPER COMPANY

Export Department: 78 River St., Springfield, Vermont, U. S. A.

[illegible] West North Ave., Chicago 39, Ill. · [illegible] Empire State Bldg., New York 1, N. Y.
6 Martel Bldg., 6514 West Manchester Avenue, Los Angeles 45, California

Fellows Injection Molding Machines
Here is molding machine design at its finest which can mean *real money* in any molder's pocket.
Model 6C-8 up to 7 cycles per min. dry run, 10 oz. acetate per shot, 100 pounds per hour plasticizing.
8-ounce
6-ounce
3-ounce
Model 1B-8-15, up to 10 shots per min. dry run, 45 pounds per hour plasticizing.
Model 6-200 rapid cycling, 200 ton mold locking force, large die capacity.

THE BURLINGTON LIARS' CLUB
SPINS A YARN FOR BAKER'S MAGDOLITE

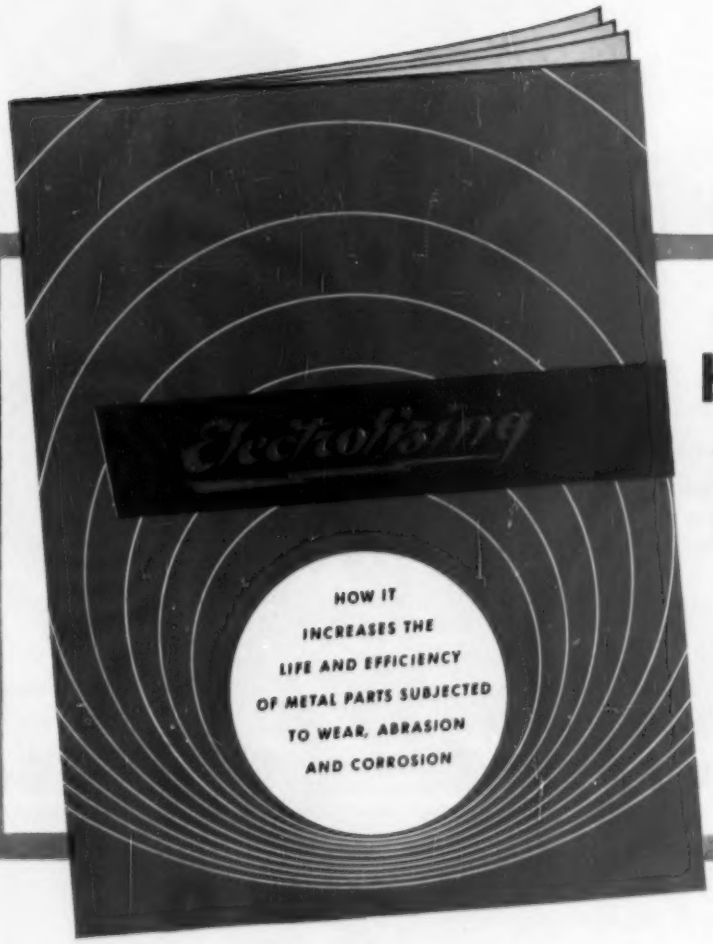
WINNER BY A DRAW!

Two-Gun Smith, a fellow who lived down in Texas, was the fastest man on the draw that ever lived. One day he walked into one of those high-toned saloons in El Paso, where they had a full-length mirror hanging at the end of the bar. When Two-Gun saw himself in the glass, he figured such an ornery looking cuss might be looking for trouble, so he eased his hands a mite toward his shootin' irons. Naturally, the hard looking hombre in the mirror did the same. That was enough for Two-Gun. He shucked his hawg laigs and started shootin'—and he was so fast that he beat himself to the draw!

Two-Gun Smith was a man of quick but calculated decisions . . . you might say that he aimed before he drew. If he was working for your company, you could bet your bottom dollar he wouldn't fool around when it came time to order dolomite. In that split-second when his hand was poised over his 'phone, his trigger-like mind would be comparing the chemical, physical, and mineralogical properties of all dolomites. And then, moving with the speed of an uncoiling rattler, he'd grab the 'phone and beller: "Send me a carload of BAKER'S MAGDOLITE—the original dad-burned (he means dead-burned) dolomite. It's always 5 ways better . . . Composition, Preparation, Strength, Economy, and Quality!"

JEBCO
PRODUCTS
SINCE 1889
MAKERS OF BAKER'S MAGDOLITE

THE J. E. BAKER COMPANY
YORK, PENNSYLVANIA
Plants: York, Billmeyer, Pennsylvania—Millersville, Ohio



How to Increase Wear Part Life 2 to 10 Times...

Without Changing Design, Materials or Methods

YOU can increase the life of wear parts 2 to 10 times without a single change in design, materials or methods. Highly regarded manufacturers of everything from home appliances to military equipment are doing it with Electrolizing after trying conventional treatments without success.

Electrolizing increases the surface hardness of ferrous and non-ferrous metals, reduces friction to a remarkable degree and provides exceptional resistance to wear, abrasion and galling.

The 16-page booklet pictured above answers nearly every question you might ask about the Electrolizing process. Applications . . . typical case histories . . . why Electrolizing does not warp or distort parts . . . how high surface hardness is obtained . . . why Electrolizing does not adversely affect the mechanical properties of the base metal . . . how dimensions are held to a tolerance of .000025"—these are a few of the basic points covered. There are many more.

Send for your free booklet today. It may contain the answer to your friction, wear and abrasion problems. There is no obligation...use the convenient coupon.

THE Electrolizing CORPORATION

1505D East End Avenue, Chicago Heights, Illinois

Other Plants:

Providence, R. I. 148 W. River St. | Cleveland, Ohio 1325 E. 152nd St. | Los Angeles 21, Cal. 1406 East 15th St.

The Electrolizing Corporation
1505D East End Avenue, Chicago Heights, Ill.

Name.....

Company.....

Address.....

City.....Zone.....State.....

you can hit

pay dirt

in COLD FINISHED
BAR STEEL

. . . when you buy it
from your
J&L DISTRIBUTOR

You reduce inventory costs in:

1. SPACE
2. CAPITAL INVESTMENT
3. LOSSES

Your J&L Distributor's stock contains a complete and well-assorted range of cold finished steels.

You obtain cost-saving services by:

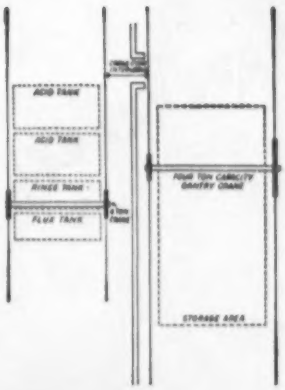
1. FAST DELIVERY
2. HELP IN EMERGENCIES
3. EXPERIENCE IN STEEL APPLICATIONS

A telephone call brings you the services of the J&L Distributor. Call him today . . . and every day when you need Cold Finished Steels.

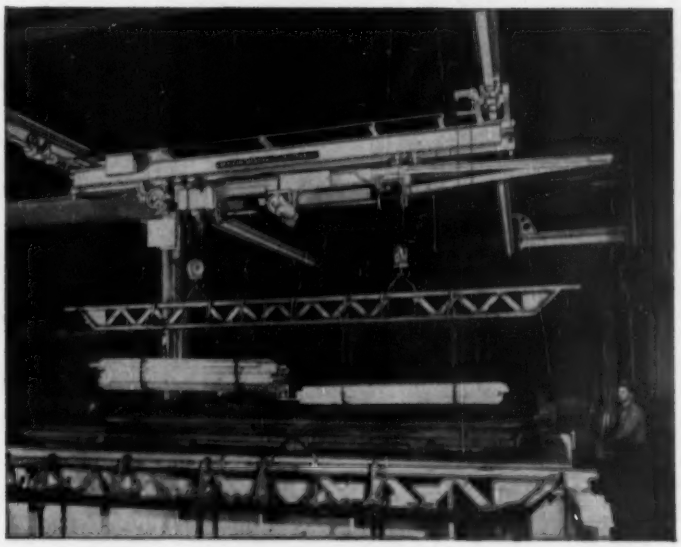
distributors in all
major industrial centers

J&L STEEL

Jones & Laughlin
STEEL CORPORATION — Pittsburgh



AMERICAN MONORAIL GANTRY CRANE SYSTEM *speeds galvanizing!*



Steel fence posts travel from fabrication to galvanizing over a gantry bridge which interlocks at a crossover track through doorway for passage to the MonoRail crane serving the tanks in the plating room.

All travel on the 4-ton system is motor operated and controlled by push-button station in the operator's hand.

Here is truly team-work handling that results in cost savings as well as increased tonnage through the galvanizing process. It is a typical example of American MonoRail engineering available at no obligation for the solution of your handling problems.

Send for Bulletin C-1 illustrating hundreds of successful Mono-Rail installations.

AMERICAN OVERHEAD HANDLING EQUIPMENT

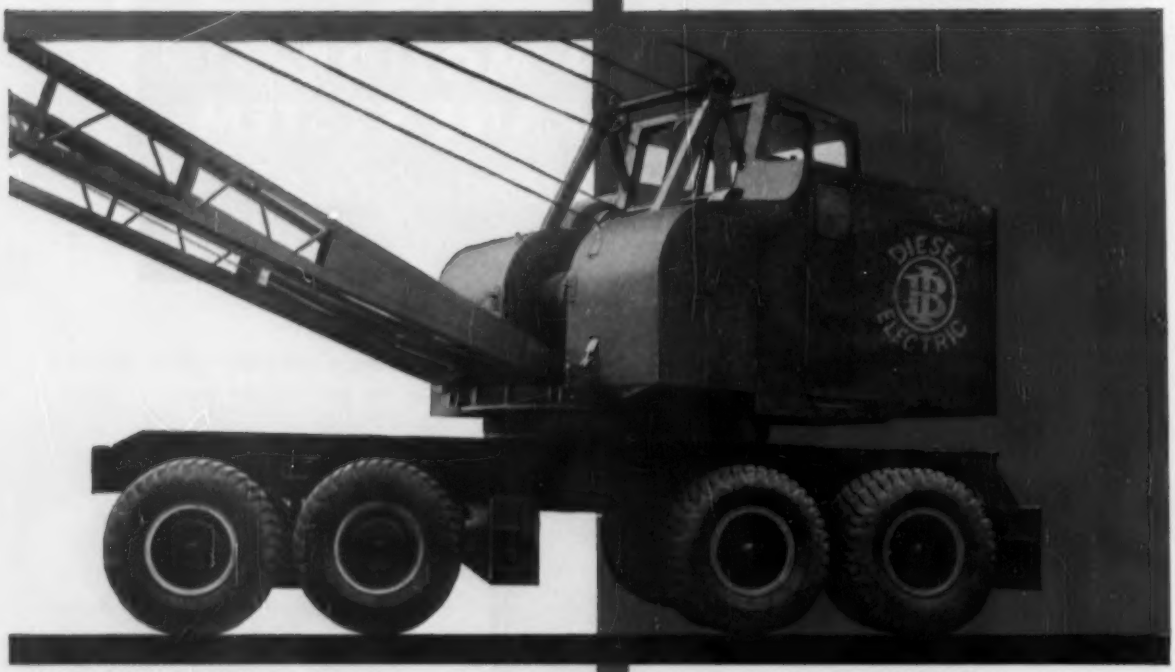
AMERICAN MONORAIL COMPANY

13103 ATHENS AVENUE • CLEVELAND 7, OHIO

announcing

America's first and only rubber-tired diesel electric cranes

electric travel, electric rotation!
25 to 60 ton capacities!



Designed and built by Industrial Brownhoist Corporation for mines, quarries, railroads, steel mills, the lumber industry and other large manufacturing plants that require mobile materials handling equipment in heavy duty capacities, America's first Diesel Electric Wagon Crane is now in production. Available in capacities from 25 to 60 tons, the new wagon crane will be equipped with dynamatic clutch, anti-friction bearings at essential points, and power steering. It employs electric travel and electric rotation. Mounted on a 12-wheel crane carrier capable of speeds up to 8 miles per hour, the unit can be operated by one man from easy-to-reach crane and carrier controls. Rigorous tests indicate that the new machine provides economical operation and insures added savings of time and labor in heavy duty materials handling work. For complete details, consult a Brownhoist representative or write us today.

BROWNHOIST MATERIALS HANDLING EQUIPMENT GIVES A LIFT TO AMERICAN INDUSTRY

INDUSTRIAL BROWNHOIST CORPORATION
BAY CITY, MICHIGAN DISTRICT OFFICES: New York, Philadelphia, Pittsburgh, Cleveland, Chicago, Denver, San Francisco, Montreal • AGENCIES: Detroit, Birmingham, Houston

DIVISION OF Penn-Texas

179

BROWNHOIST

HEAVY LOAD/LIGHT WORK

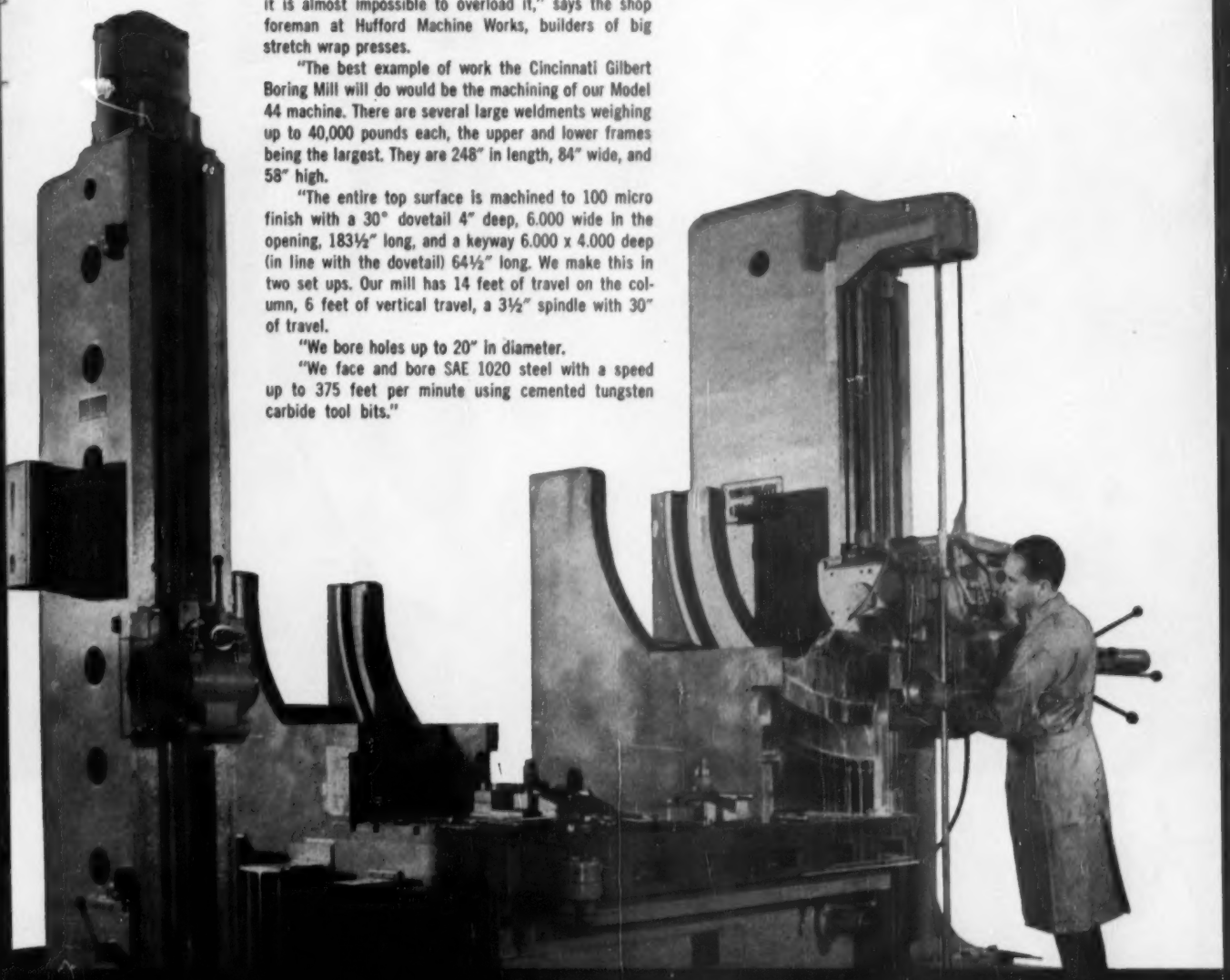
"The thing I like about the Cincinnati Gilbert is that it is almost impossible to overload it," says the shop foreman at Hufford Machine Works, builders of big stretch wrap presses.

"The best example of work the Cincinnati Gilbert Boring Mill will do would be the machining of our Model 44 machine. There are several large weldments weighing up to 40,000 pounds each, the upper and lower frames being the largest. They are 248" in length, 84" wide, and 58" high.

"The entire top surface is machined to 100 micro finish with a 30° dovetail 4" deep, 6.000 wide in the opening, 183½" long, and a keyway 6.000 x 4.000 deep (in line with the dovetail) 64½" long. We make this in two set ups. Our mill has 14 feet of travel on the column, 6 feet of vertical travel, a 3½" spindle with 30" of travel.

"We bore holes up to 20" in diameter.

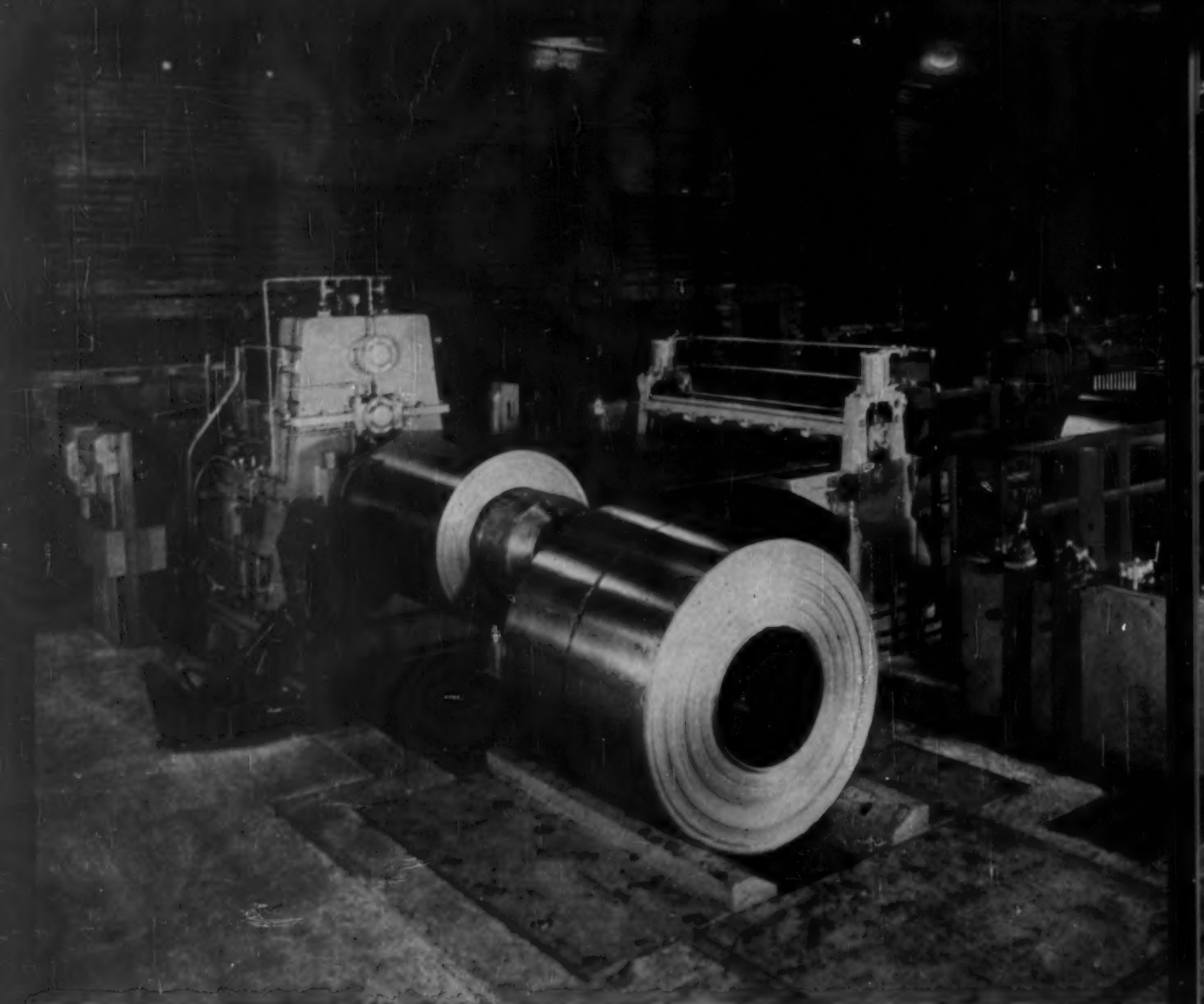
"We face and bore SAE 1020 steel with a speed up to 375 feet per minute using cemented tungsten carbide tool bits."



Centralized controls, frictionless response, maximum flow of power from motor to tool make light work of heavy loads on a Gilbert. Hufford uses a floor type machine with sliding table. Many other arrangements are available. Write for literature on these versatile machines.

GILBERT

THE CINCINNATI GILBERT MACHINE TOOL COMPANY • 3366 BEEKMAN STREET, CINCINNATI 23, OHIO



Wean Flying Shear Line (Entry End)

In the past decade steel making has made advancements in product development and production unmatched by any other industry.

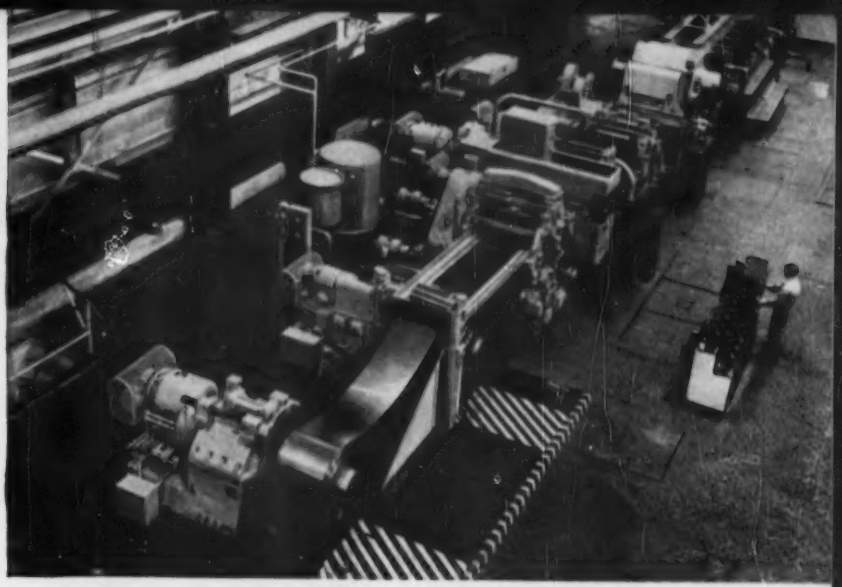
The demand for better, more versatile steels, at rates that a few short years ago were beyond comprehension, has furnished the impetus. But the backbone of this tremendous revolution has been supplied by experienced metallurgists, who developed the materials, and engineering firms, like Wean, who designed and built the machinery necessary.

The equipment pictured on these pages is typical. Wean-Halidon shear lines, cleaning and coating lines are rewriting performance records wherever they are in operation. This is the kind of progress that causes leading steel producers the world over to make certain they talk with Wean before they buy.

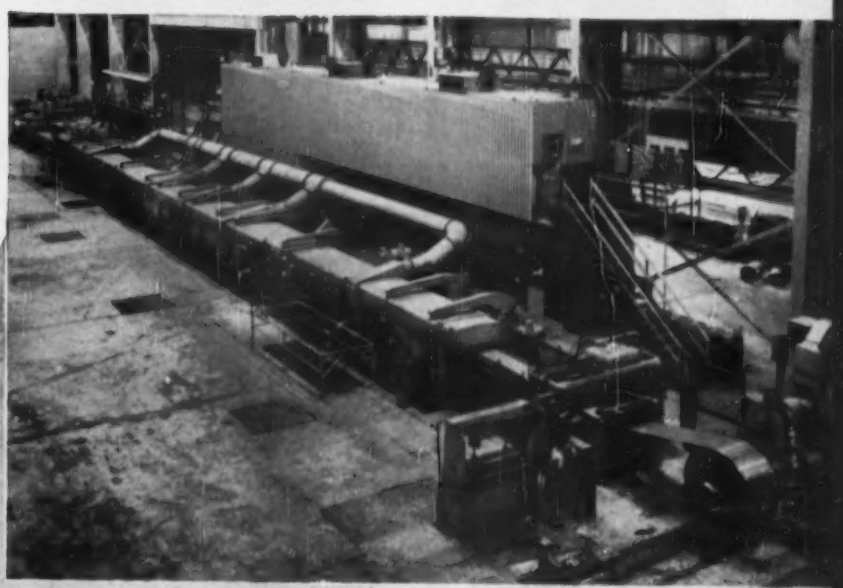
The WEAN ENGINEERING COMPANY, Inc.

WARREN ---------- OHIO

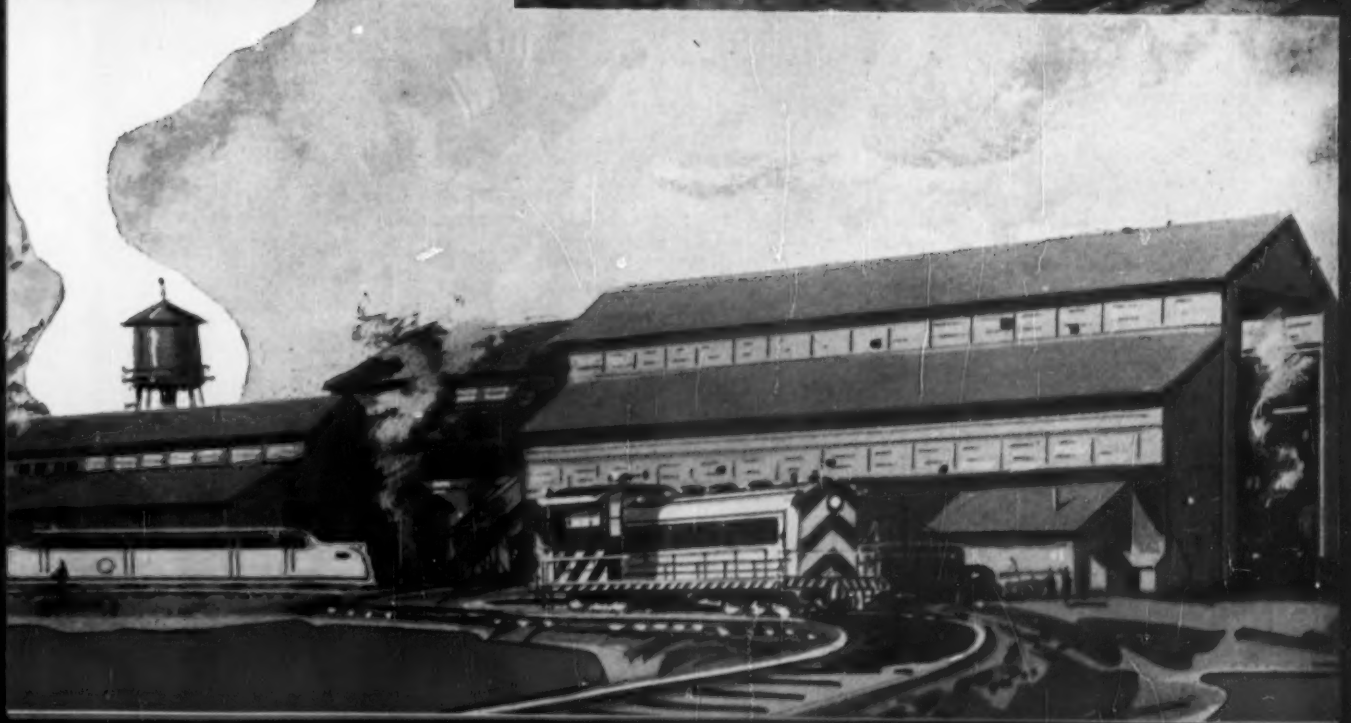
SPECIALISTS IN SHEET, STRIP AND TIN MILL EQUIPMENT

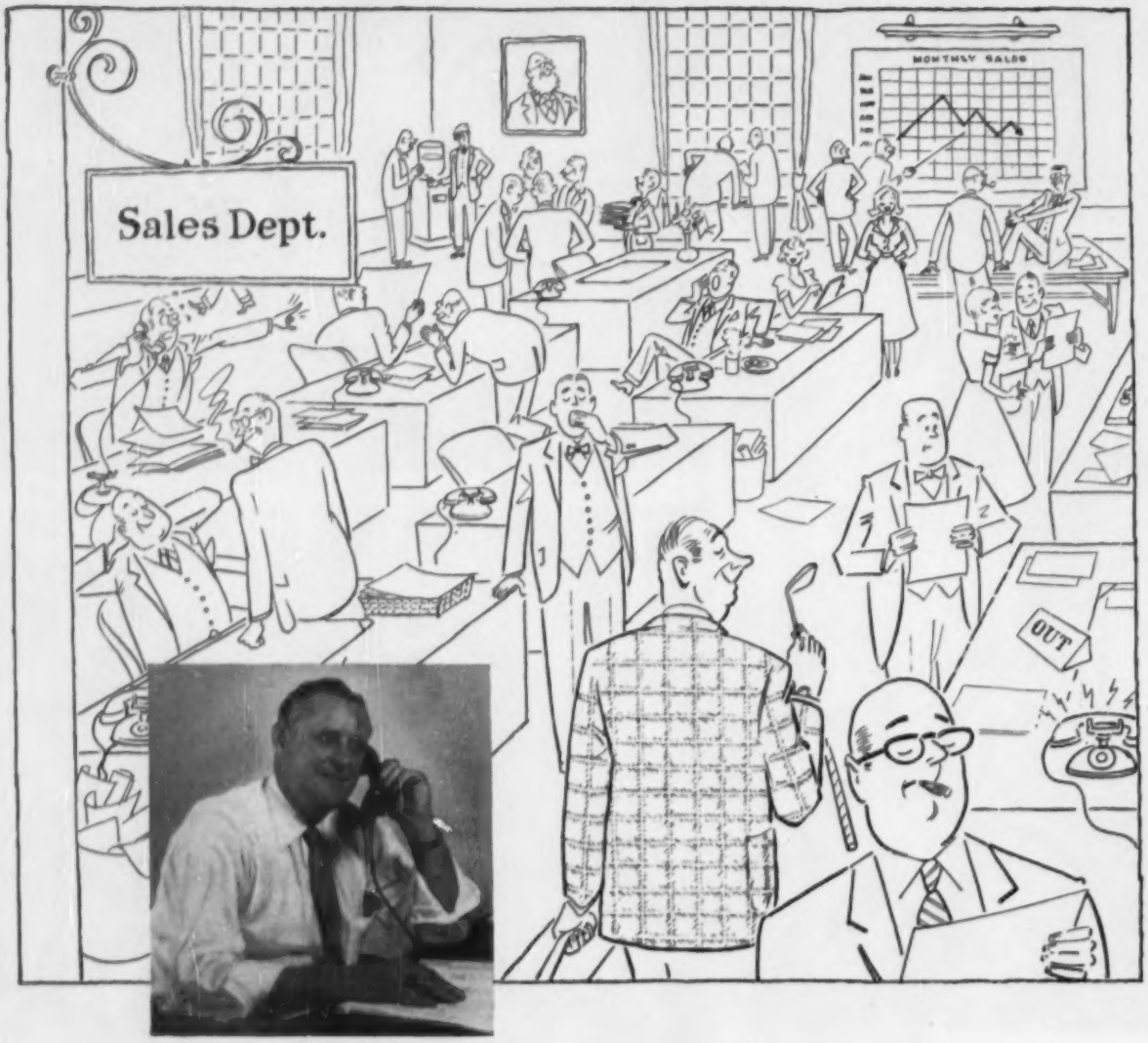


Wean Continuous
Coating Line



Wean Electrolytic
Cleaning Line





You call ONE MAN . . . not a "bored meeting" when you order Bristol Brass

YOU don't have to "go down the line" . . . and back over it again and again . . . when you do business with Bristol. You deal with one man all the way . . . one man who has both the mill experience and sales know-how to speed your order straight through. You won't get the "I don't know but I'll ask someone who does and have him call you back" treatment. Whoever talks to you at Bristol has the full authority and responsibility to get your Brass to you quickest way. Nor does he have to be a vice president!

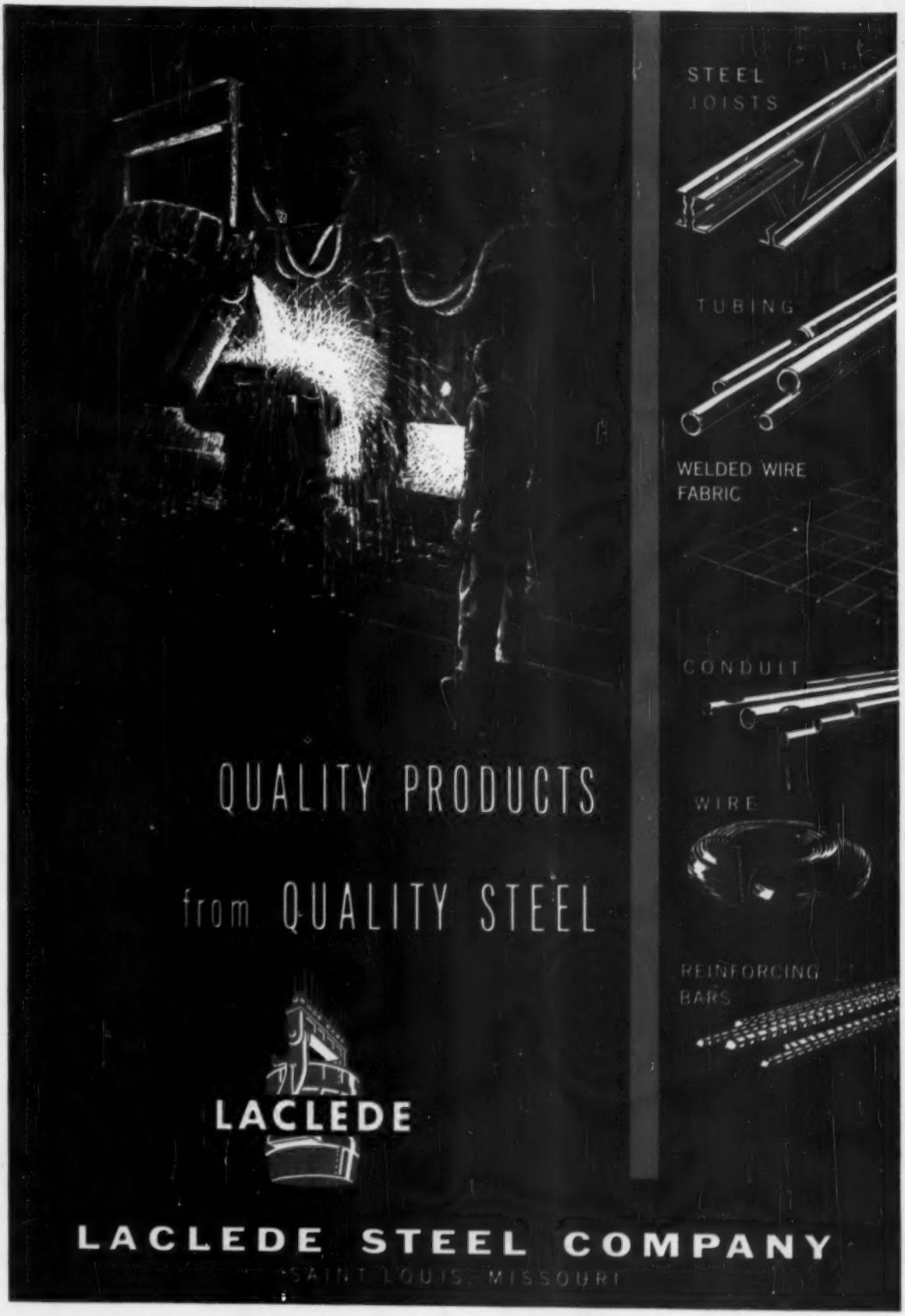
And once your specifications are set in the mill, your interests are protected by the personal interest which Bristol mill men will take in your orders. You're not an order number . . . you're a recognized individual . . . and we're not too big to forget it.

So all you have to do when you call Bristol (Connecticut) Ludlow 3-9246 is simply to say: "I want to place an order". And the next voice you hear will be that of the man who'll take it from there to your receiving department.

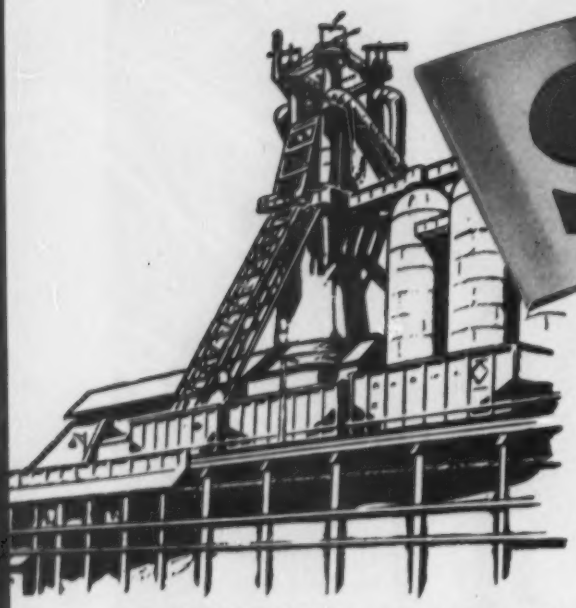
The Bristol Brass Corporation has been making Brass strip, rod and wire here in Bristol, Connecticut since 1850, and has offices and warehouses in Albany, Boston, Buffalo, Chicago, Cleveland, Detroit, Milwaukee, New York, Philadelphia, Providence, Rochester, Syracuse. The Bristol Brass Corporation of California, 1217 East 6th St., Los Angeles 21. The Bristol Brass Corporation of Ohio, 1607 Broadway, Dayton.

And now . . . BRASS FORGINGS, too . . .
The Bristol Brass Corporation announces the acquisition of Accurate Brass Company, 73rd Ave. & 88th St., Brooklyn 27, N.Y.
"How do you know it can't be forged?"

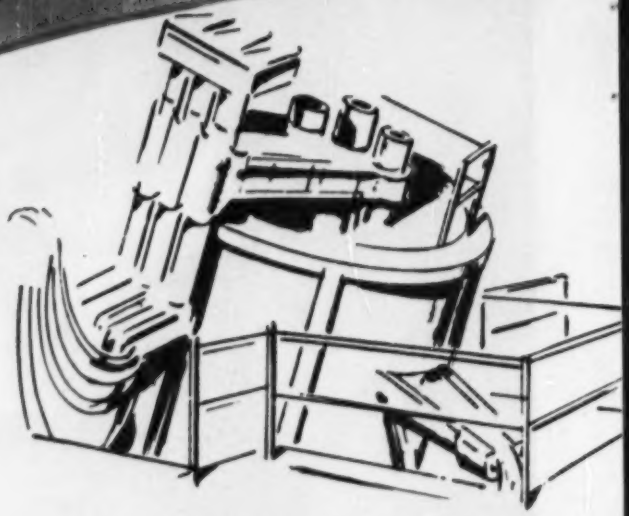
"Bristol-Fashion" means **Brass at its Best**


STEEL JOISTS
TUBING
WELDED WIRE FABRIC
CONDUIT
WIRE
REINFORCING BARS
QUALITY PRODUCTS
from QUALITY STEEL
LACLEDE
LACLEDE STEEL COMPANY
SAINT LOUIS, MISSOURI

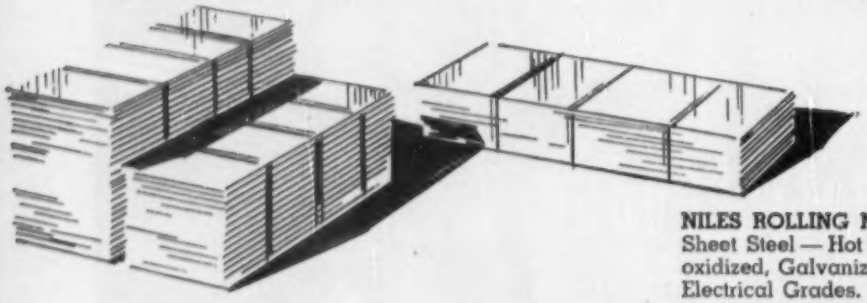
SHARON



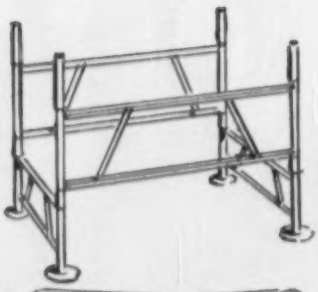
ROEMER WORKS — Farrell, Pennsylvania
Steel Manufacturing Division: Pig Iron, Open Hearth Ingots, Blooms, Slabs, Billets, Sheet Bar and Plates. Finishing Division: Carbon, Alloy and Stainless Hot and Cold Rolled Strip Steel, Black, Pickled and Coated Strip Steel, Sharon Galvanite, Special Alloy Coated, N. A. X. and Cor-Ten Strip Steels.



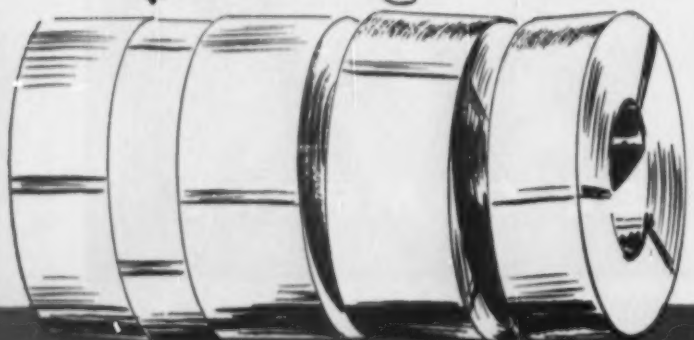
LOWELLVILLE WORKS — Lowellville, Ohio
Pig Iron, Open Hearth and Electric Furnace Ingots, Blooms, Slabs, Sheet Bar, Billets and Plates.



NILES ROLLING MILL DIVISION — Niles, Ohio
Sheet Steel — Hot Rolled, Pickled, Annealed, Deoxidized, Galvanized, Galvanite, Long Terne and Electrical Grades.



BRAINARD STEEL DIVISION — Warren, Ohio
Tensional Steel Strapping, Heavy Duty Strapping, Strapping Tools and Accessories, Electric Welded Steel Tubing, Tel-O-Posts, Steel Strong Posts, Brite-Lite and Standard Areawalls, Roll-Formed Steel Lintels, Anti-Checking Irons, Brainard Scaffolding.

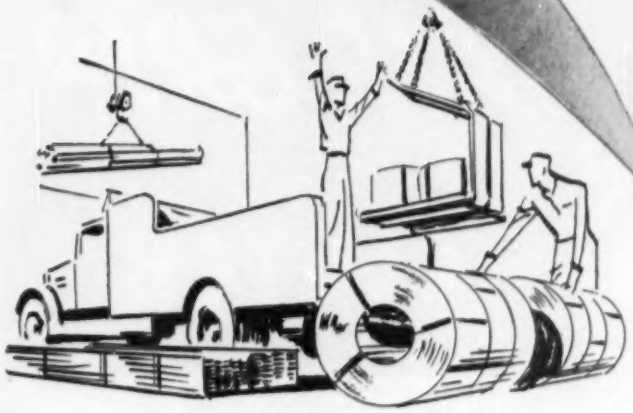


DETROIT TUBE & STEEL DIVISION
Detroit, Michigan
Cold Rolled Strip Steel, Low Carbon — High Carbon, N. A. X. and Cor-Ten Strip Steel.

SHARON STEEL CORPORATION
Sharon, Pennsylvania

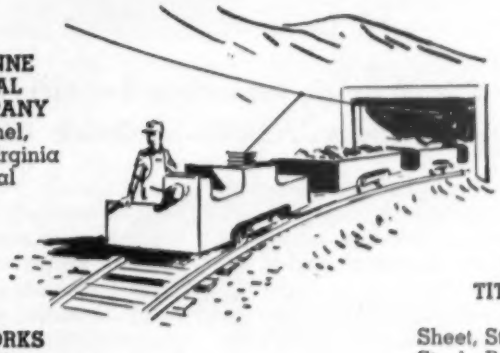
SHARONSTEEL

STEEL



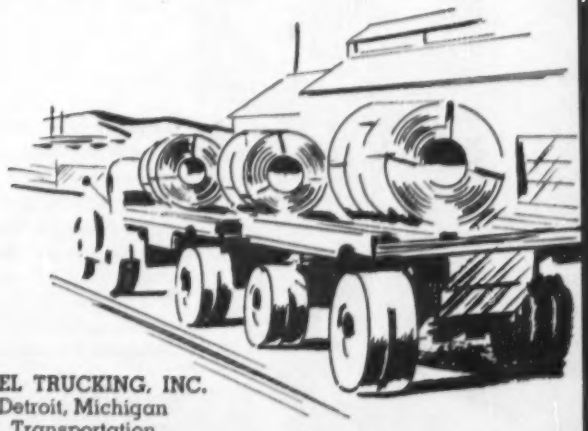
SHARONSTEEL PRODUCTS DIVISION
Detroit, Michigan and
Farrell, Pennsylvania
Warehouse Distributors.

JOANNE COAL COMPANY
Rachel,
West Virginia
Coal



MALLORY-SHARON TITANIUM CORPORATION
Niles, Ohio
Sheet, Strip, Forged Rod, Bar, and Billet Stock, Rolled Rod and Bar.

FAIRMONT COKE WORKS
Fairmont, West Virginia
By-Product Coke

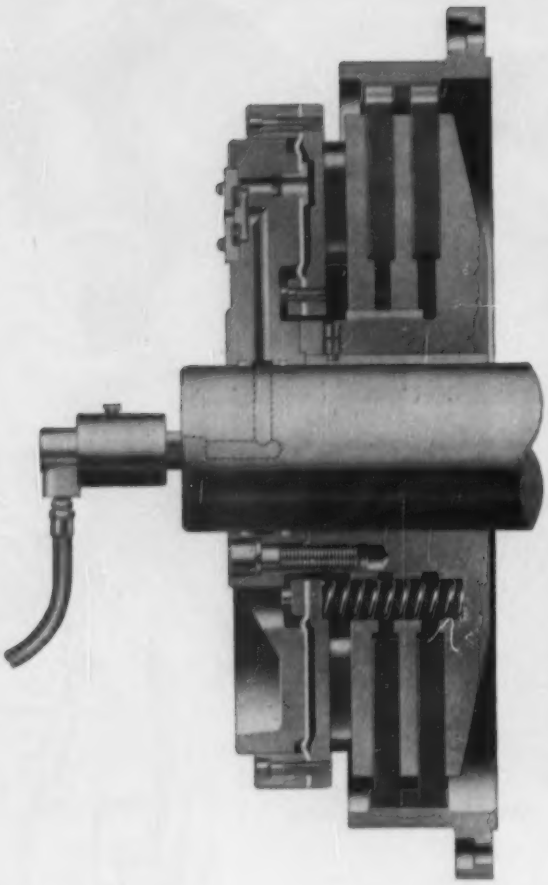


CARPENTERTOWN COAL & COKE COMPANY — Mt. Pleasant, Pennsylvania
Coal and Bee-Hive Coke

STEEL TRUCKING, INC.
Detroit, Michigan
Transportation

Sales Offices

Chicago, Cleveland, Cincinnati, Detroit, Houston, Kansas City, Los Angeles, Milwaukee, New York, Philadelphia, Rochester, San Francisco, Seattle, Montreal, Que., Toronto, Ont.



DODGE AIR-GRIP CLUTCH

Announcing a NEW Air Clutch with Amazing Sensitivity . . . Cooler Operation . . . Extreme Compactness . . . Built-in Quick Release Valves

Finger tips on the throttle bring instant response, give the operator split-second control. This new product of Dodge is the quickest-acting air clutch available!

New design and engineering by Dodge achieve this exceptional control—in a clutch that provides maximum torque capacity in minimum space. Less air is used to operate the clutch—the result is a new sensitivity that enables the operator to "inch" the clutch, or to throw it into full engagement as required. Where instant disengagement is needed, quick release valves are built into the clutch itself, as optional equipment.

The unique design of the Air-Grip Clutch places the air seal disc at the end *farthest* from the pressure plates, which generate the heat inherent in clutch operation. This, combined with automatic internal ventilation, insures cooler operation and longer life under severest service. Provision is made for mechanical engagement of the clutch if the air supply should fail.

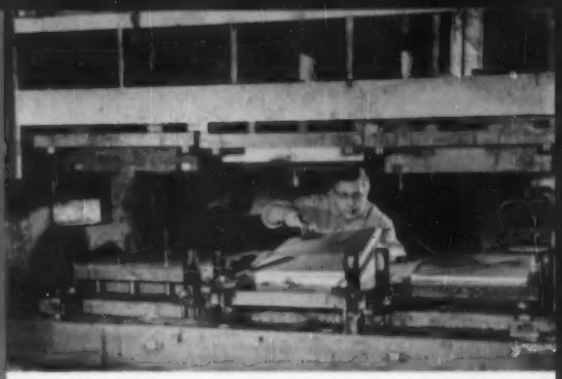
Thorough tests in the field as well as in the laboratory assure you of Dodge dependability in the Air-Grip Clutch. Available in sizes from 8.5 to 460 hp at 100 rpm at 80 psi. Call your local Dodge Distributor or write for Bulletin A634.

DODGE MANUFACTURING CORPORATION
800 UNION STREET, MISHAWAKA, INDIANA

DODGE
of Mishawaka, Ind.

Sixty years of experience in serving industry's clutch needs . . . manufacturer of the famous Dodge Diamond D and Rolling Grip mechanical clutches.

Call the Transmissioneer, your local Dodge Distributor. Factory trained by Dodge, he can give you valuable assistance on new, cost-saving methods. Look for his name under "Power Transmission Machinery" in your classified telephone directory, or write us.



Hydraulic press where door panels are formed. Left-hand die punches and forms; center die second-forms and trims excess metal, right-hand die final forms.

Punching and counter-sinking holes for handle and fastenings.

Strikingly beautiful **color-chrome gas range** by Magic Chef, Inc., St. Louis, Mo.

How Stainless Steel helps Magic Chef bring glamour into the kitchen

MAGIC CHEF'S new *color-chrome gas range* is an eye-catcher anywhere you see it—in the kitchen or on the sales floor. Highlighting the beautiful decorator colors of the porcelain enamel top and sides is a front of gleaming Stainless Steel.

There's real beauty here, but that's not the whole story. There's the durability of long-lasting Stainless Steel. And there's the ease with which Stainless Steel's smooth, dense surface can be cleaned—year after year.

This is the kind of sales appeal that Stainless lends to an almost countless list of products. And you can have it with surprising ease of fabrication (See "Fabricating Facts"). Put this appeal in your products, and when you do, follow the lead of successful fabricators who use service-tested USS Stainless Steel in the products they make.

FABRICATING FACTS

Compartment door, oven door and broiler drawer panels are fabricated from USS 18-8 Stainless Steel sheets, No. 3 finish.

Sheets are dry-coated with drawing compound, then sheared to blank size. Forming takes place in an hydraulic press, using three dies. Stainless Steel sheets form easily and without distortion in a die setup designed for carbon steel sheets.

Panels are paper-wrapped to protect against scratching; holes for fasteners are punched and counter-sunk. Dry-coating is removed; panels are sub-assembled and sent to the production line for final assembly.

See The United States Steel Hour. It's a full-hour TV program presented every other week by United States Steel. Consult your local newspaper for time and station.

UNITED STATES STEEL CORPORATION, PITTSBURGH • AMERICAN STEEL & WIRE DIVISION, CLEVELAND
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO • NATIONAL TUBE DIVISION, PITTSBURGH
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.
UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS STAINLESS STEEL

SHEETS • STRIP • PLATES • BARS • BILLETS • PIPE • TUBES • WIRE • SPECIAL SECTIONS

5-99

UNITED STATES STEEL

"We've got this

says Joseph Asmonga,

UNITED STATES STEEL

heat treating down cold"

U. S. Steel Heat Treater

In the entire production of steel forgings, no single operation is more important or more finicky than the heat treating. Here, with careful heating and quenching, the forging is tailor-made to the physical properties you require.

At best, heat treating is a complicated business. And when you get into the giant forgings made at our Homestead Forgings Division, you encounter problems absolutely unknown in the production of smaller forgings. Only a handful of men in this country have the skill to do the job. One of them is Joseph Asmonga, a Heat Treater for 18 of the 25 years he has been with U. S. Steel.

Sheer *size* is a great problem and often makes liquid oil or water quenching impracticable. In the photograph, Mr. Asmonga is *air* quenching a roll arbor—and it takes him 10 hours just to reduce the temperature from about 1750°F. to 650°F.

Admittedly, Mr. Asmonga has an eye-popping array of instruments, furnaces and cranes to help him—as well as a complete metallurgical staff. But when you get right down to it, it takes plain old experience and skill to change a list of specifications into a finished, precisely heat treated forging.

Joseph Asmonga is typical of the men who actually do the work on your U·S·S Quality Forgings. All of these men have the skill, the equipment and the *determination* to give you the finest steel forgings that money can buy. Write for more information and our free 32-page booklet describing U·S·S Quality Forgings. Address United States Steel Corporation, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

USS

Quality FORGINGS

- heavy machinery parts—carbon, alloy, stainless
- electrical and water wheel shafts
- hammer bases and columns
- forged steel rolls and back-up roll sleeves

REFRACTORY CONCRETE

is easy to make with a Castable Refractory

Just add water to a packaged castable, mix, and you're ready to place refractory concrete. Castable refractories supply you with the right combination of selected aggregates and Lumnite* calcium-aluminate cement carefully proportioned to meet the heat resistance and insulation requirements of many jobs.

Chances are this convenient way to make Refractory Concrete can speed work and cut costs on your next refractory job. Why not keep a few bags on hand—you'll have "two strikes" on your next emergency repair! Castables are made and distributed by manufacturers of refractories.

Refractory concrete made with castables is the *adaptable* refractory—can be easily placed in any size or shape . . . resists severe thermal shock and spalling. It can be poured, troweled or "shot" on by cement gun, and it's ready for service in 24 hours or less.

For additional information, write Lumnite Division, Universal Atlas Cement Company, (United States Steel Corporation Subsidiary), 100 Park Avenue, New York 17, N. Y. or contact any of the offices shown below.

OFFICES: Albany • Birmingham • Boston • Chicago • Dayton
Kansas City • Minneapolis • New York • Philadelphia • Pittsburgh
St. Louis • Waco

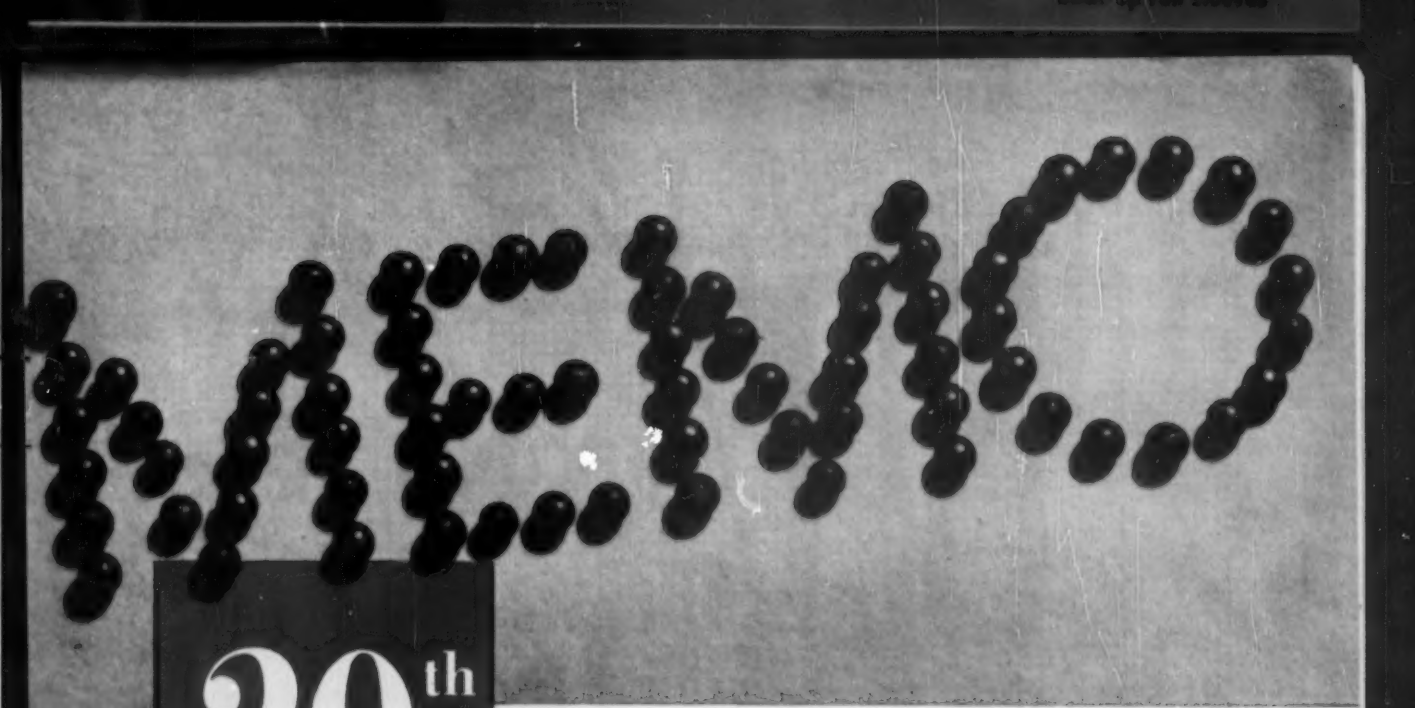
*"LUMNITE" is the registered trade-mark of the calcium-aluminate cement manufactured by Universal Atlas Cement Company.

BC-L-94

ATLAS® **LUMNITE for INDUSTRIAL CONCRETES**

REFRACTORY, INSULATING, OVERNIGHT, CORROSION-RESISTANT

UNITED STATES STEEL HOUR—Televised alternate weeks—See your newspaper for time and station.



20th Century

the persuasive abrasive

Make a mental note to specify 20th Century *Normalized shot or grit for your abrasive requirements. It's manufactured under close laboratory control to assure consistent high quality, greater uniformity and longer wear.

Foundries and metal-working plants throughout the United States and Canada have found 20th Century *Normalized, the persuasive abrasive, the answer to maximum production efficiency and economy.

Write for our new catalog No. 1153.

THE CLEVELAND Metal Abrasive CO.

803 East 67th Street • Cleveland 8, Ohio
Howell Works: Howell, Michigan

*One of the world's largest producers of quality shot, grit and powder — Hard Iron — Malleable (*Normalized) — Cut Wire — Cast Steel (Realsteel)*

** Copyrighted trade name*

Various parts for these Caterpillar-built D8 tractors are peened and cleaned by 20th Century metallic abrasives.

660 OPERATIONS PER HOUR AT...

80% EFFICIENCY

33 Tractor Pedestals Drilled and Chamfered with BAUSH 3-Way Horizontal Unit!

The 3-Way Horizontal Unit illustrated — designed and built by Baush to do this specific job, consists of:

3 Mechanical Leadscrew Units
1 — 10 Spindle Fixed-Center Head
1 — 6 Spindle Fixed-Center Head
1 — 4 Spindle Fixed-Center Head

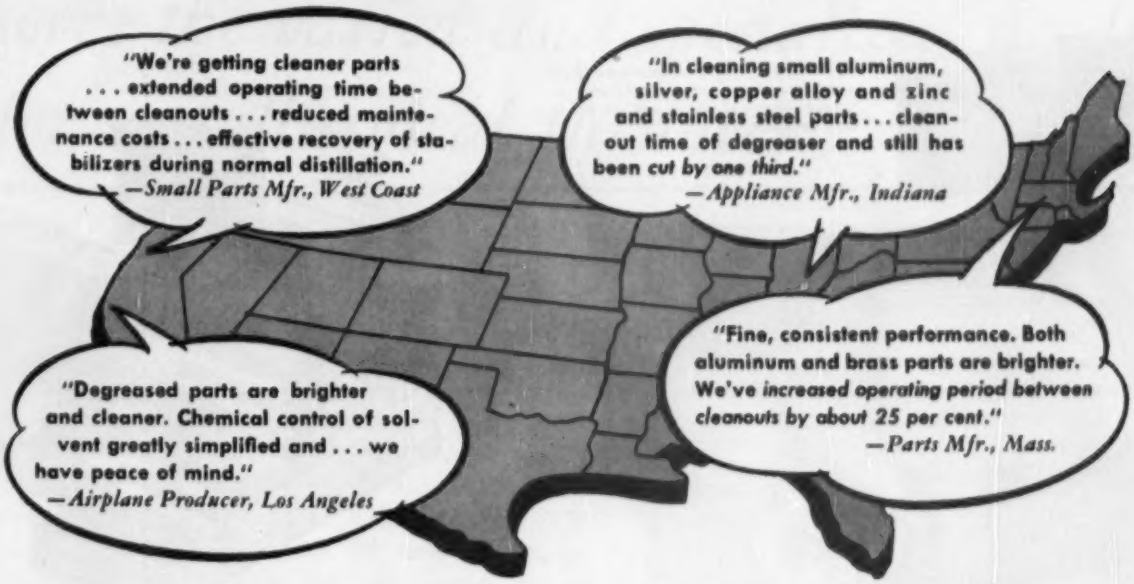
J.I.C. Controls and Automatic Lubrication. Holding Fixture.

Part: Pedestal for Tractor
Operations: 10 Drilling — 10 Chamfering
Production: 33 Pedestals per hour at 80% efficiency — A total of 660 operations per hour.

Let Baush design and build equipment to meet your specific machining problems for faster, economical, quality production. Send us your problems — there is no obligation.

BAUSH
MACHINE TOOL CO.
SPRINGFIELD 7, MASSACHUSETTS

Here's what they're saying about
ALL-PURPOSE TRICLENE® D
(Trichlorethylene)


"We're getting cleaner parts . . . extended operating time between cleanouts . . . reduced maintenance costs . . . effective recovery of stabilizers during normal distillation."
—Small Parts Mfr., West Coast
"In cleaning small aluminum, silver, copper alloy and zinc and stainless steel parts . . . clean-out time of degreaser and still has been cut by one third."
—Appliance Mfr., Indiana
"Degreased parts are brighter and cleaner. Chemical control of solvent greatly simplified and . . . we have peace of mind."
—Airplane Producer, Los Angeles
"Fine, consistent performance. Both aluminum and brass parts are brighter. We've increased operating period between cleanouts by about 25 per cent."
—Parts Mfr., Mass.

Du Pont's vapor degreasing solvent gives you brighter, better cleaning of all metals

Check these extras

EXTRA DURABILITY. *New* "Triclene" D has unsurpassed resistance to *all* major causes of solvent breakdown—heat, light, air, light metal chlorides, and acidic materials. It retains its original ruggedness even after repeated use and distillation.

EXTRA OPERATING ECONOMY. You get safe, thorough cleaning with *new* "Triclene" D. Rejects are not a problem . . . cleanouts are quicker and easier.

EXTRA CONVENIENCE. *New* "Triclene" D is truly ALL-PURPOSE—built to give you dependable performance in *any* degreasing job. Just *one* brand of solvent to buy for any type degreaser . . . for any class work.

All these extras add up to the finest solvent ever produced for vapor degreasing—new, all-purpose "Triclene" D. Let us tell you more about it. Just fill out and mail coupon below.

New All-Purpose
"TRICLENE" D
Trichlorethylene
DU PONT
Reg. U. S. Pat. Off.
BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

SEND FOR THIS NEW DESCRIPTIVE FOLDER

E. I. du Pont de Nemours & Co. (Inc.)
Electrochemicals Department, Wilmington 98, Del.

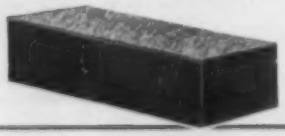
☐ Please send me your descriptive folder on new, all-purpose "TRICLENE" D.
☐ Please have your representative call with the details.

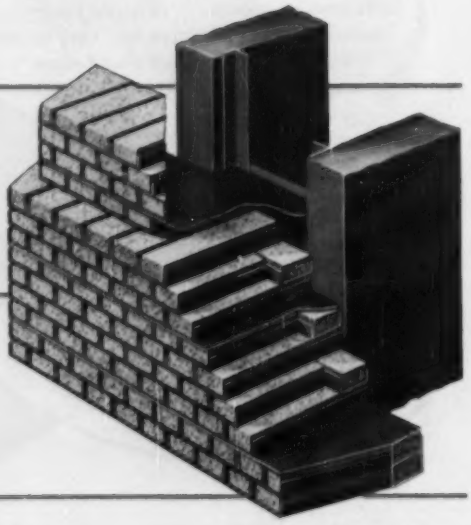
Name _____ *Position* _____
Firm _____
Address _____
City _____ *State* _____

HARBISON-WALKER

CHROMEX B—an extremely hard fired chrome-magnesite refractory having unusual constancy of volume and strength at high temperatures.

METALKASE—the pioneer metal-encased basic brick possessing an unusual combination of desirable properties.





CHROMEX—a chemically-bonded chrome-magnesite brick having excellent spalling resistance.

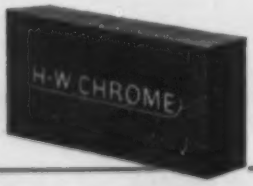
MAGNEX—a chemically-bonded magnesite-chrome brick—highly basic and of low spalling tendency.

Typical section of open-hearth furnace front wall built of METALKASE. For maximum stability steel plates are used at every fourth course vertically. These are tack-welded to steel bars which in turn extend behind the buckstay and are free to move vertically.

H-W MAGNESITE—the standard burned magnesite refractory for more than half a century.

THERMAG—a hard burned magnesite-chrome refractory possessing enhanced physical properties.

H-W CHROME—a hard burned chrome brick especially adapted for various specific uses.



FORSTERITE—the only commercially produced magnesium-silicate brick—suited for certain particular applications.

H-W PERIKLASE—an exceptional high-magnesia brick of unusual high-temperature stability.

OTHER HARBISON-WALKER BASIC REFRACTORIES

H-W MAGNAMIX (for monolithic banks and bottoms)
H-W C-MIX (92% magnesia ramming mixture)
H-W WASHINGTON DEAD BURNED MAGNESITE GRAINS
H-W SPECIAL FURNACE CHROME
PLASTIC THERMOLITH BATCH
THERMOLITH AND OTHER BASIC CEMENTS

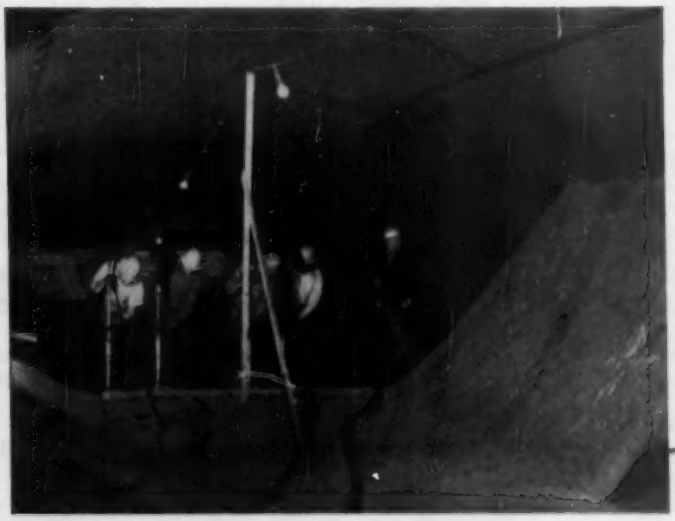
BASIC REFRACTORIES

serve the varied and specialized needs for metallurgical furnaces

Shown at the left are the various brands of Harbison-Walker basic refractories. They include classes especially suited for each particular need in open-hearth and electric steel furnaces, soaking pits and various other furnaces.

Among the brands listed here are types and classes established as standards for furnaces employed in the metallurgy of ferrous and non-ferrous metals and alloys.

The superior performance of Harbison-Walker basic refractories is the result of: (1) a thorough knowledge of the requirements gained through close cooperation with producers of metals and alloys; (2) extensive and continuous original research; and (3) the use of top quality raw materials processed in modern plants under close laboratory control. Harbison-Walker uses the most up-to-date methods and equipment to insure the quality and dependable uniformity of basic refractories.



(*Above*) In basic linings of electric furnaces, METALKASE are used in the upper side walls and provide maximum resistance to spalling and to slagging action. Lower side walls and sub-bottom are built of H-W MAGNESITE. MAGNAMIX or H-W DEAD BURNED MAGNESITE forms the monolithic banks and bottom.

(*Left*) H-W MAGNAMIX bottom section in a new open-hearth furnace. Air hammers are used to ram the material into a dense, monolithic working hearth of the desired thickness and contour.

HARBISON-WALKER REFRACTORIES CO.

AND SUBSIDIARIES

GENERAL OFFICES • PITTSBURGH 22, PENNSYLVANIA

World's Largest Producer of Refractories

ELECTROMET

TRADE-MARK

CHRO

YOU HAVE A CHOICE OF

SIMPLEX low-carbon ferrochrome—containing maximum 0.010% or maximum 0.025% carbon. Available with silicon contents of 5.00 to 7.00% or maximum 1.50%.

SIMPLEX nitrogen-bearing, low-carbon ferrochrome—in 2% and 5% nitrogen grades.

Low-carbon ferrochrome—with carbon grades ranging from 0.02 to 2.00% maximum.

Nitrogen-bearing, low-carbon ferrochrome—with grades containing 0.75 to 2.00% nitrogen.

High-carbon ferrochrome—with carbon grades ranging from 3.00 to 7.00% maximum.

Low-chromium, high-carbon ferrochrome—in maximum 5.00% and maximum 6.00% carbon grades.

High-carbon ferrochrome—of 7.00% minimum carbon content.

"SM" ferrochrome—containing 4.00 to 6.00% carbon.

Exothermic ferrochrome and exothermic silicon-chrome.

Ferrochrome-silicon.

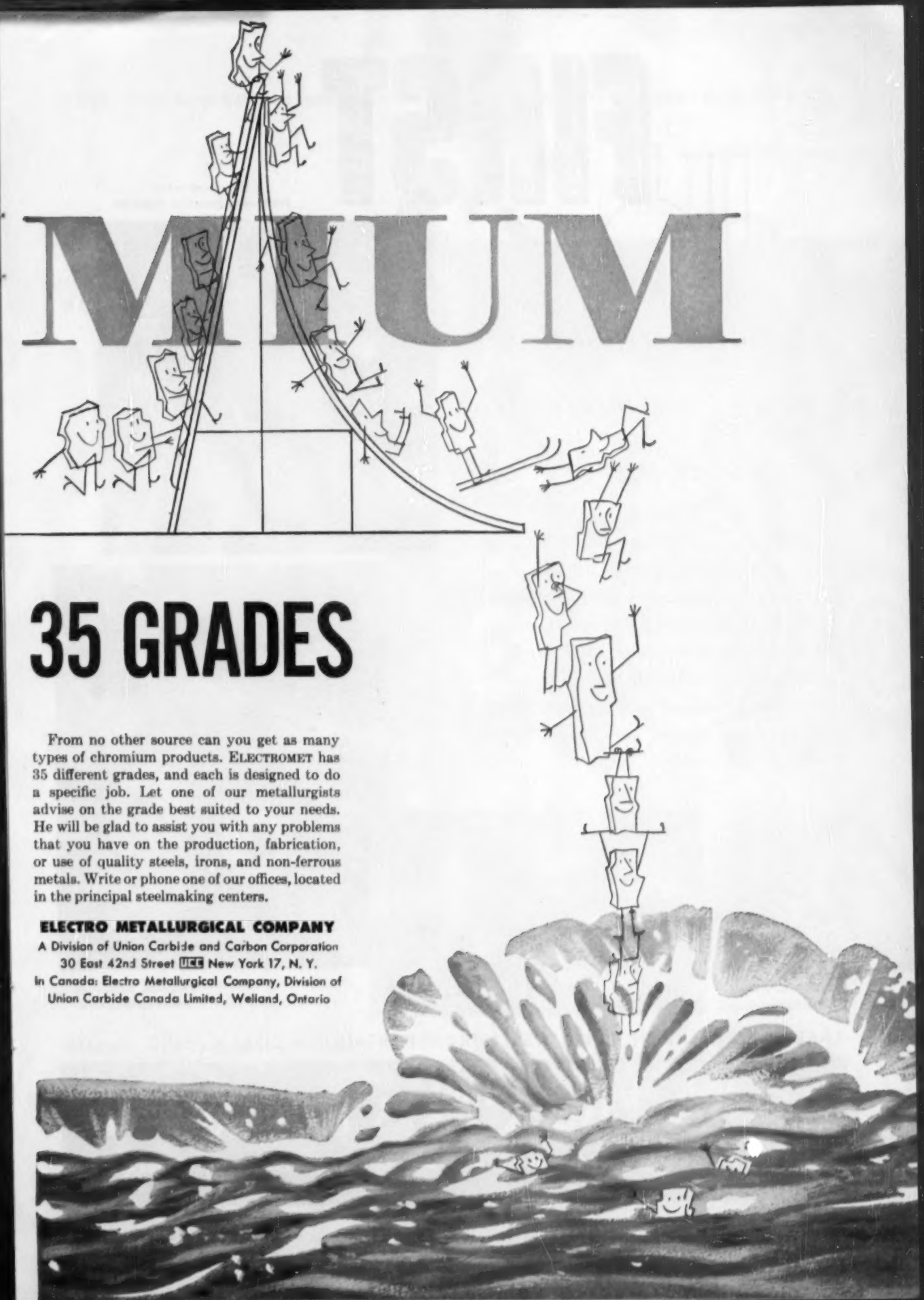
Ferrosilicon-chrome.

Electrolytic chromium metal—with minimum chromium content of 99.00%.

Foundry ferrochrome—high- and low-carbon grades.

Chromium briquets—each containing 2 pounds of chromium.

The terms "Electromet," "Simplex," and "SM" are trade-marks of Union Carbide and Carbon Corporation.



35 GRADES

From no other source can you get as many types of chromium products. ELECTROMET has 35 different grades, and each is designed to do a specific job. Let one of our metallurgists advise on the grade best suited to your needs. He will be glad to assist you with any problems that you have on the production, fabrication, or use of quality steels, irons, and non-ferrous metals. Write or phone one of our offices, located in the principal steelmaking centers.

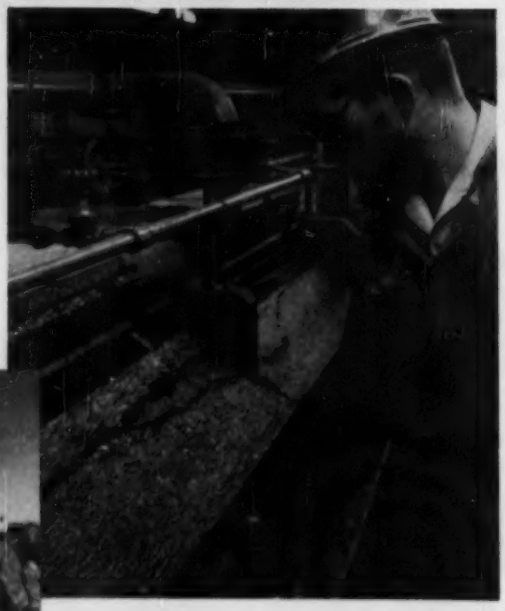
ELECTRO METALLURGICAL COMPANY
A Division of Union Carbide and Carbon Corporation
30 East 42nd Street UCC New York 17, N. Y.
In Canada: Electro Metallurgical Company, Division of Union Carbide Canada Limited, Welland, Ontario

FIRST

Humboldt Mine
Steffensen Flotation Machine

...to use a flotation process to convert lean "specular jaspery" ore

At the plant of the Humboldt Mining Company, Ishpeming, Michigan, this process was first applied to produce concentrates from jasper rock. The accompanying photographs show some of the operations. This plant, owned jointly by the Cleveland-Cliffs Iron Company and the Ford Motor Company can turn out more than 200,000 tons of high grade ore per year.



Close-Up Steffensen Flotation Machine

General View of Humboldt Mine

LAKE SUPERIOR IRON ORE • VESSEL TRANSPORTATION • COAL • FERRO ALLOYS

THE Cleveland-Cliffs IRON COMPANY

UNION COMMERCE BUILDING • CLEVELAND 14, OHIO

NOW— *from Borg-Warner's centrally located Ingersoll Steel Division, at New Castle, Indiana...*

FORGING QUALITY

INGOTS

UP TO

23,000 POUNDS

to your own analysis

If you've been looking for a dependable source for ingots of superior forging quality, it will pay you well to see how Ingersoll can serve you with:

- **Electric furnace carbon steel or alloy grades to your own analysis and specifications.**
- **Ingots in any size and shape from 400 pounds to 23,000 pounds.**
- **Great flexibility in production schedules—set up to fit in with your own forging requirements.**
- **Ample capacity to meet your needs . . . on schedule.**
- **The assurance of uniform high quality from one heat to the next.**

FOR FULL DETAILS—WRITE, WIRE OR PHONE—NOW

ENGINEERING B-W PRODUCTION

Ingersoll

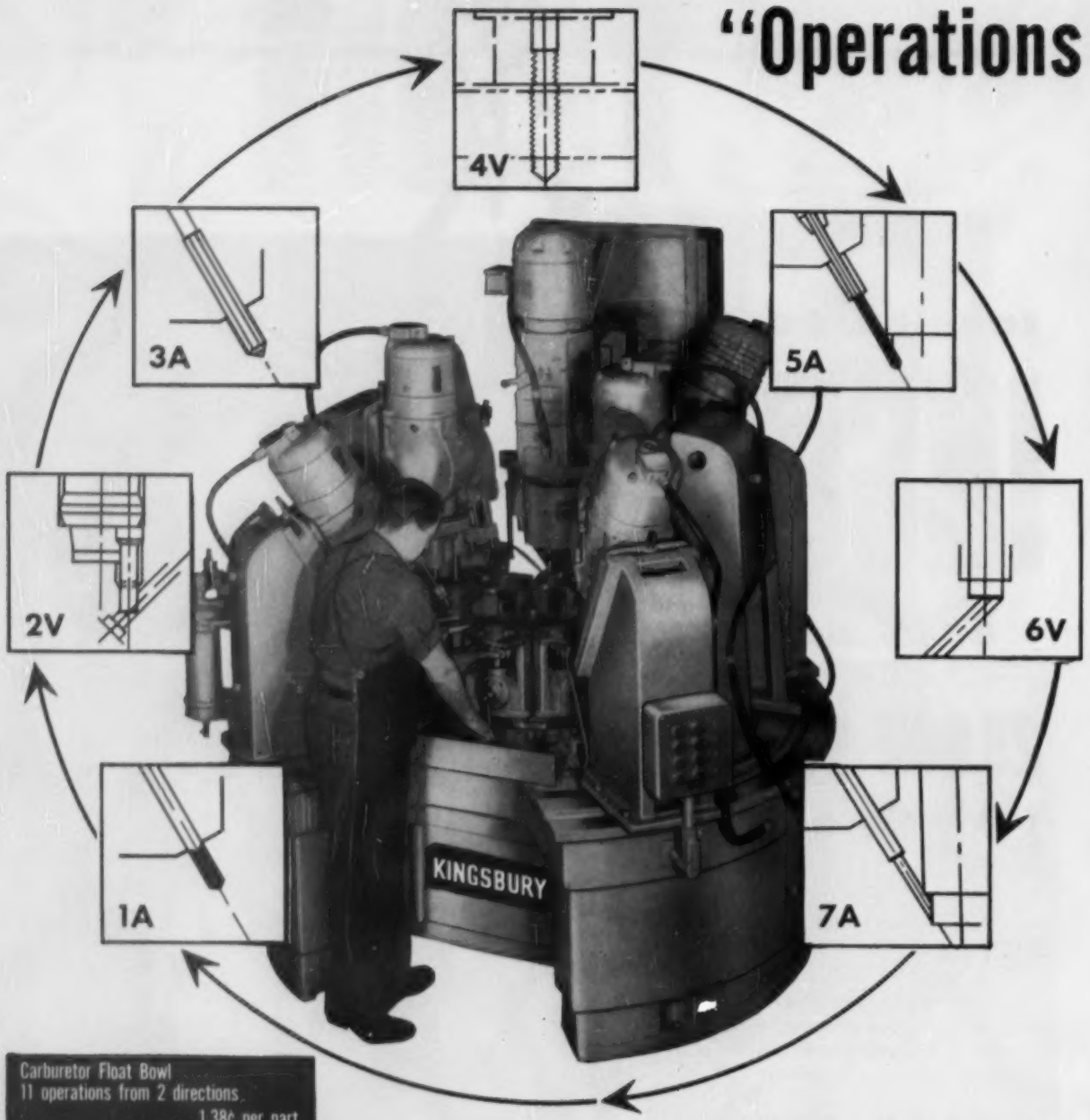
STEEL DIVISION

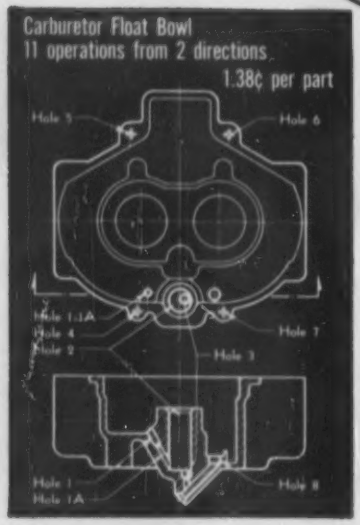
Borg-Warner Corporation

New Castle, Indiana

alloy steels • armor plate • carbon electric steel for tank clutch discs • clutch plate steels • heat-resisting steels • IngAclad stainless-clad steel • knife steels saw steels, including high speed hack saw blade steels shovel steels • soft center steel • stainless steels Tem-Cross cross-rolled steel • tillage steels.

"Operations





Watch this Kingsbury drill, ream,

. . . at the rate of 55.9 operations every minute!

It works on a Carburetor Float Bowl (zinc-alloy die casting) operating on 7 vertical and 2 angular holes. It produces 305 parts per hour gross, at a cost of 1.38c per part.

This Kingsbury machine was custom-built to do a high production — low cost job on this particular piece. Four angle (A) and three vertical (V) units, operating 10 spindles, are mounted on a 60 inch base. Eight work fixtures (one for unloading and loading) are mounted on a 30 inch index turret, which indexes through the seven work stations in approximately 44 seconds. During this cycle the machine performs 11 precision operations, including broaching.

Let's follow through a work cycle — and remember this can go on day after day, year after year, producing accurate parts at low cost.

Kingsbury" all count up for profit

Let's look at these four machines

Combining operations makes it possible to perform more work in a given period of time.

On a Kingsbury Machine the tools at each station perform one or more of the required operations within a set time interval. The object is to perform all required work on the piece in one chucking within one cycle through the machine.

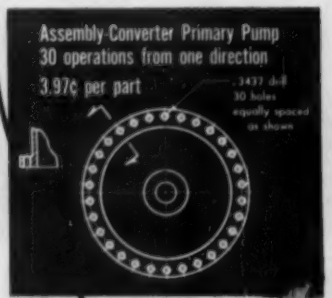
A single piece may be worked upon by different tools from several directions simultaneously. Everything except loading and unloading is controlled automatically — the machine takes over completely, carrying the work from station to station until the part is finished to specifications.

You save — because one machine does the work of several, with one operator, one chucking . . . and a high standard of accuracy that practically eliminates scrap loss. *You gain* through greater and more uniform output.

Kingsbury Machine Tool Corp.
104 Laurel Street, Keene, N. H.

148.3 operations per minute

The machine drills, mills, end-mills, c'sinks and taps, at seven operational points. Seventeen tools function at six Kingsbury Units, mounted on a 60 inch base. The 30 inch index turret has eight work fixtures. Gross production 370 parts per hour.

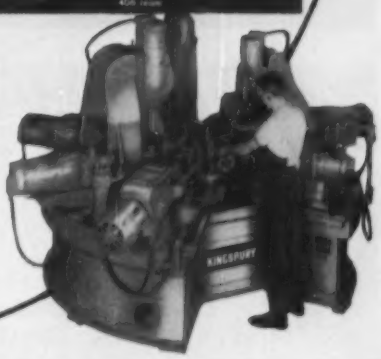


51.0 operations per minute

The machine drills equally-spaced holes in a bolt circle slightly over 12 inches diameter. One vertical Kingsbury Unit with multiple spindle head operates 6 drills. The work fixture indexes five times to produce 30 holes — then moves to free the work for unloading and loading. Gross production 102 parts per hour.

63.3 operations per minute

The machine drills, reams, c'sinks and taps at eight operational points. Eighteen tools function at seven Kingsbury Units mounted on a 100 inch base. The 20 inch index turret has eight work fixtures. Gross production 211 parts per hour.



seat, burnish, broach and tap

Unit 1A .136 drills Hole 1 at 60° angle, 1/8 inch deep.

Unit 2V operates on cored Holes 2 and 3. It has a combination burnishing and broaching tool attached to the quill of the drill head. Spindle is eliminated. Feed mechanism of drill head forces tool downward. It .625 burnishes Hole 2 to a depth of 1 inch and .125 broaches Hole 3 to a depth of 3/8 inch. Hole 3 is located .1875 off center line of Hole 2.

Unit 3A .1375 reams Hole 1.

Unit 4V has a four spindle auxiliary drill head; taps Holes 4, 5, 6, 7 (10-32 NF Taps).

Unit 5A .057 drills Hole 1-A at same 60° angle, 5/8 inch deep.

Unit 6V .250 burrs intersecting hole at bottom of Hole 8.

Unit 7V .136 burrs flat bottom seat in Hole 1.

One operator loads and unloads.

Each Unit Cost on the drawings includes the cost of the man and of the machine — no power or overhead. We assumed:

Unit cost of man equal to:

$$\frac{\text{average U. S. hourly wage}}{\text{hourly gross x 80\% eff.}}$$

Unit cost of machine to be:

$$\frac{\text{price of tooled machine}}{\text{output in 6000 hrs. @ 80\% eff.}}$$

KINGSBURY

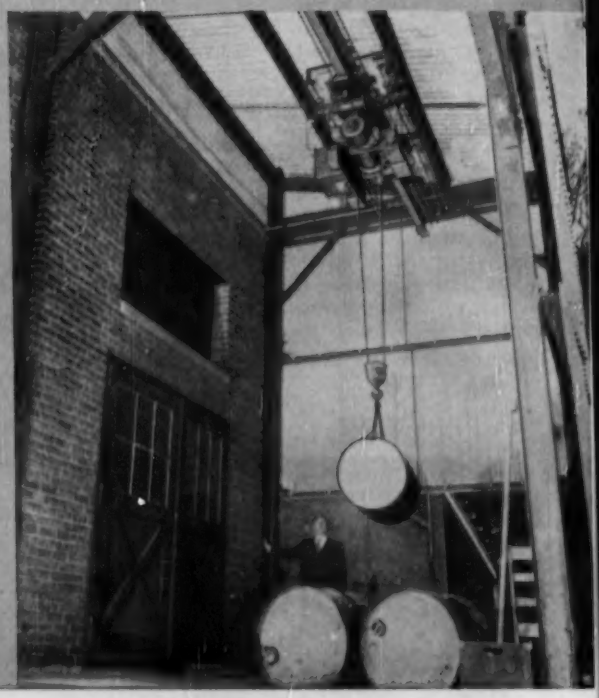
AUTOMATIC DRILLING AND TAPPING MACHINES
for Low-Cost High Production

Cuts Die-Handling Time in ½

A large aircraft builder wrote: "Time and handling in this operation have been cut approximately in half by use of the Tramrail. In addition," operators report much greater safety and less danger of personal injury in handling heavy parts."

Automatic System Eliminates Three 10-ton Trucks

The need of three 10-ton trucks to haul materials between buildings was eliminated by a Cleveland Tramrail automatic dispatch system which does the job quickly without attendants accompanying. In addition, many man-hours of working time are saved daily and the load on an elevator is greatly reduced.



OVER 40,000 CLEVELAND TRAMRAIL NOW SERVE INDUSTRIAL

NOTE THIS: Regardless of size or type, MOST CLEVELAND TRAMRAIL INSTALLATIONS PAY FOR THEMSELVES WITHIN ONE YEAR—and they keep on paying handsome dividends year after year thereafter.

If you do not have an accurate cost record of all of your manufacturing operations, you may be astounded at the tremendous price you are paying to pick materials up, move and set them down. This may be your biggest expense item.

Illustrated here are a few actual case examples of the great savings and other important advantages

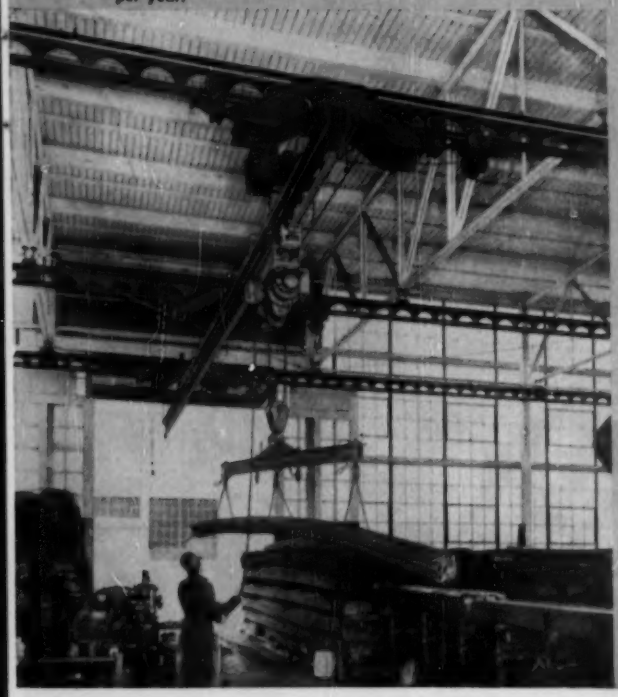
GET THIS BOOK!
BOOKLET No. 2008. Packed with valuable information. Profusely illustrated. Write for free copy

CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO.
4864 EAST 284th ST. WICKLIFFE, OHIO

CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT

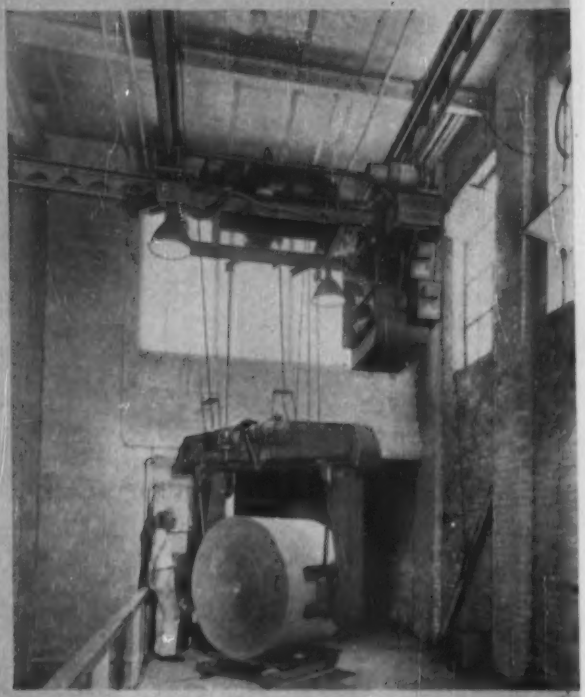
Saves $5,000 Yearly on Steel Cost

A West Coast manufacturer installed a completely motorized 5-ton Cleveland Tramrail transfer bridge that interlocks with an outside track over a railroad siding. Because this enables handling 5-ton bundles, a $2.00 per ton bundling charge is saved on steel purchased. Handling time is also saved. Since 200 tons are used monthly the total savings amount to $5,000 per year.



7,500 lbs. Paper Spoilage Saved Daily

Among other important cost-reducing advantages, this cab-operated crane with motorized roll grab in a large paper warehouse, cuts damage losses by 1% of total tonnage handled. Approximately 150 rolls weighing 750,000 lbs. are handled daily.

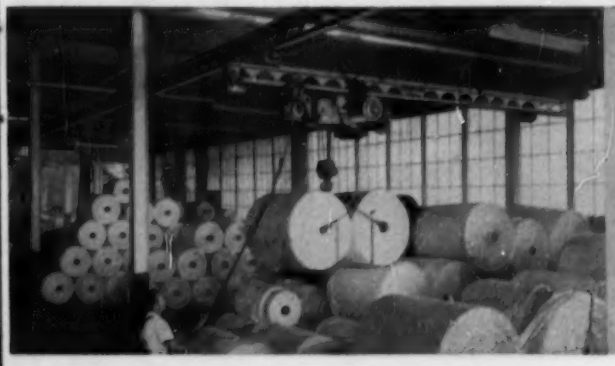


INSTALLATIONS AMERICA

Cleveland Tramrail has brought about in nearly every industry. Most likely you, too, have materials handling jobs in your plant from which big savings can be made. Why not have our engineers make a study and present recommendations, without obligation, of course?

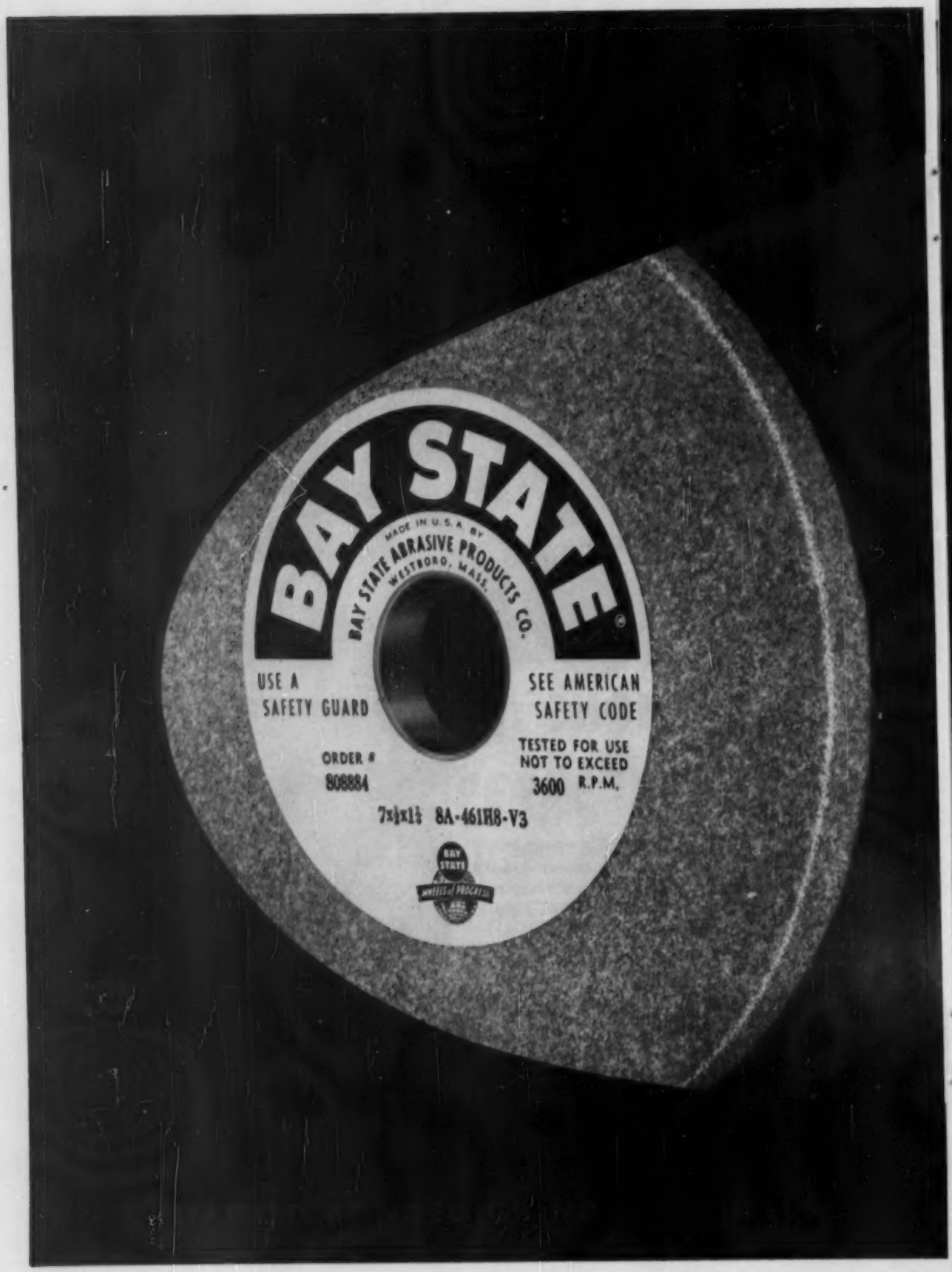
Foundry Jumps from 3 Heats to 8 Daily

With no increase in man power, the installation of an inexpensive Cleveland Tramrail handpropelled system in a small brass foundry, made a terrific difference in their operations. It made possible 8 heats a day instead of 3, formerly usual. Despite more than double output, the men are less fatigued now at the end of a day.



Increases Roll Storage Capacity 50%

The 400-lb. cloth rolls in foreground could only be piled two high until the Tramrail bridge was installed. Now one man can pile them three high easily. He can also deliver them to other parts of the building on the bridge and overhead track, directly without rehandling, thus cutting cost in this way, too.


BAY STATE
MADE IN U.S.A. BY
BAY STATE ABRASIVE PRODUCTS CO.
WESTBORO, MASS.
USE A
SAFETY GUARD
SEE AMERICAN
SAFETY CODE
ORDER #
808884
TESTED FOR USE
NOT TO EXCEED
3600 R.P.M.
7x1x1¼ 8A-46IH8-V3
BAY STATE
WHEELS of PROGRESS

Available...

TWO EXTRA OPPORTUNITIES!

For each single hardness grade standard in the industry for precision grinding, BAY STATE makes *three* grade divisions. These "Fractional Grades" provide you with two *extra* opportunities to get a closer "fit" of vitrified bonded wheels for your grinding operations.

This extra refinement is standard at BAY STATE. Such close control, developed through advanced manufacturing techniques, means that BAY STATE does a *better* job of duplicating successful wheel specifications.

For improved precision grinding, get the *extra* benefits of "Fractional Grades" . . . with BAY STATE "WHEELS OF PROGRESS".

HERE'S PROGRESS IN GRINDING

(a) **FRACTIONAL GRADES** (b)

The three wheels above vary only in hardness. The middle one, with the figure 2 marked by the arrow, has an exact hardness of grade H. It is flanked by the two *extra* grade divisions you can get from BAY STATE:

(a) 1 means 1/3 *softer* in grade H.
(b) 3 means 1/3 *harder* in grade H.

Such extra, *standard* specifications mean progress in grinding for you . . . from BAY STATE.

BAY STATE ®

WHEELS of PROGRESS

BAY STATE ABRASIVE PRODUCTS CO., Westboro, Massachusetts, U. S. A.

Branch Offices and Warehouses — Chicago, Cleveland, Detroit, Pittsburgh
Distributors — All principal cities
In Canada: Bay State Abrasive Products Co. (Canada) Ltd., Brantford, Ont.

no job too big!

A major consideration in choosing your weldment source is the extent of your supplier's facilities. Graver facilities include the most modern inspection equipment, as well as heat-treating and stress-relieving furnaces able to handle weldments as large as 50 tons.

In addition, there is available Graver's renowned welding research laboratory, plus the services of experienced design engineers who have long specialized in weldments, including those of the most intricate designs.

Alloy welding is an art! And Graver has pioneered in developing new alloy welding equipment and advanced techniques. Graver makes quality weldments in nickel, Hastelloy, stainless steel and aluminum. Whatever size job, call on Graver *first*. WRITE FOR NEW ILLUSTRATED BROCHURE: "WELDMENTS."

GRAVER TANK & MFG. CO., INC.

East Chicago, Indiana

CHICAGO • NEW YORK • PHILADELPHIA • EDGE MOOR, DEL. • ATLANTA
CATASAUQUA, PA. • PITTSBURGH • CLEVELAND • DETROIT • TULSA
SAND SPRINGS, OKLA • HOUSTON • ODESSA, TEXAS • CASPER, WYO.
LOS ANGELES • FONTANA, CAL. • SAN FRANCISCO

GRAVER ...source for *quality* weldments

More than
2000 INDUSTRIAL PLANTS . . .

. . . ARE SAVING MONEY AND UPPING EFFICIENCY WITH

SBS 30

WATERLESS SKIN CLEANSER

You'd recognize many of them "right off the bat"—leading industrial plants that have tested, proved, ordered and reordered increasing quantities of SBS-30 Waterless Skin Cleanser.

Today, as you read this, more than 2000 plants are saving workers productive time . . . licking seemingly impossible skin cleansing problems . . . and vastly improving employee relations through the magic of SBS-30 Waterless Skin Cleanser.

The use of SBS-30 in our new Waterless Washstations provides cleansing facilities that require no plumbing . . . use no water . . . are 100% portable . . . actually *"bring the washroom to the worker"* . . . and lick almost every conceivable skin cleansing problem existing in industry! You owe yourself the facts . . . mail the coupon below for completely descriptive literature.

SBS—"The Washword of Industry"

SUGAR BEET PRODUCTS CO. · SAGINAW, MICHIGAN
CHEMICAL BY-PRODUCTS DIVISION

Sugar Beet Products Company, Saginaw 17, Michigan
Rush literature on SBS-30 Waterless Skin Cleanser and Washstations

Name_____
Title_____
Company_____
Address_____
City_____ Zone____ State_____

Users tell you how

These two cut-off

On-the-job reports prove the Norton rubber bonded R50 and resinoid bonded

For wet cutting

Users' reports on how the Norton R50 adds the profit-boosting

"TOUCH of GOLD"

- **Wheel life tripled**
  Massachusetts tool manufacturer says R50 wheel, cutting-off high speed steel tap stock, lasted three times as long as best competitive wheel. Job required very smooth cut, with no burr or burn.
- **Best in every way**
  Illinois maker of combination doors and windows reports R50 wheel produced best quality cut, fastest cutting action, longest life for cutting extruded aluminum frames.
- **Longer lasting, superior cutting**
  Rhode Island oil seal manufacturer reports R50 wheel, cutting-off stainless steel, gave considerably longer life with better quality cut than any other wheel.
- **70% more durable**
  New York steel company says R50 wheel beat durability records of two best previous cutting-off wheels by 70%. Work was on high speed and carbon tool steels.
- **First among four**
  Pennsylvania manufacturer of coal mine bits reports R50 best wheel used for cutting alloy steel bit stock. Far superior, in quality of cut and durability, to three other wheels tried.
- **Best wheel ever used**
  New Jersey sporting goods manufacturer, using R50 for cutting off tubing for golf club shafts, rates this wheel far above all others for performance and economy.

The Norton R50 rubber bonded cut-off wheel is designed especially for wet cutting of ferrous bar stock up to 6" diameter. It is the wheel to use where quality of cut, without burning, is important. Built-in chip clearance — unusual in this type of wheel — is one of many "Touch of Gold" advantages for better cutting performance and longer wheel life.

Is wet or dry cutting best for YOU? — Ask your Norton distributor

Are your cutting-off jobs marred by excessive burring or burning? Are you case-hardening the work, so that it causes tool breakage? Are you wearing out your wheels too fast on high production runs? Are you looking for finished cuts — and not getting them?

If you're bothered by any of these cutting-off problems, perhaps you ought to check your methods as well as your wheels. You may, for example, be dry cutting, when wet cutting would be more efficient — or vice versa.

Your Norton Distributor's abrasive specialist, or your Norton Abrasive Engineer is ready to give you practical information on cut-off *methods* — information that can save you money every day.

See your Distributor, or write to NORTON COMPANY, Worcester 6, Mass. Distributors in all principal cities, listed under "Grinding Wheels" in your phone directory yellow pages. *Export:* Norton Behr-Manning Overseas Incorporated, Worcester 6, Mass.

wheels top all others

B9 wheels save time and money on the widest range of wet and dry applications

For dry cutting

Users' reports on how the Norton B9 adds the profit-boosting

"TOUCH of GOLD"

- **Five times better**
  California naval shipyard re-orders B9 wheel for aluminum cutting jobs. Reason: B9's 5 to 1 superiority over best previous wheel.
- **100% more cuts**
  New Jersey foundry switched to B9 wheels for cutting "Christmas tree" risers from precision castings, after tests in which B9 gave twice as many cuts.
- **Gave a 10 to 1 advantage**
  Indiana tool company praises B9 wheel as easily the best ever run for cutting-off miscellaneous hardened tools, delivering a 10 to 1 advantage over best of competition.
- **Best general purpose wheel**
  Massachusetts manufacturer of molded rubber products reports the B9 best all-around cut-off wheel in their experience. Chief jobs were cutting various types of steel up to 3" diameter.
- **Unbeatable on Inconel**
  Pennsylvania bearings company says it found no other wheels to compare with the B9 for cutting Inconel bar stock. Outperformed competitive wheels on all counts.
- **565 more cuts**
  Massachusetts manufacturer of textile equipment reports B9 wheel produced 700 cuts on 1 x ½ x ⅛" steel channels. This topped previous wheel's record of 135 cuts by 565 — for five times longer wheel life.

The Norton B9 resinoid bonded cut-off wheel is recommended for high production dry cutting jobs, especially where fast rate of cut is essential. It is made with either smooth sides or the rough "F" sides for more clearance in the cut. It will give you long, economical "Touch of Gold" performance in the widest range of ferrous and non-ferrous applications.

Making better products...to make your products better

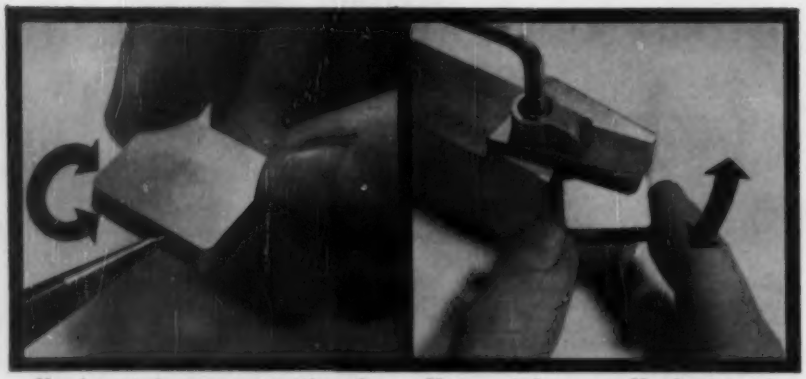
NORTON

and its BEHR-MANNING division

W-1600

NORTON: Abrasives • Grinding Wheels • Grinding Machines • Refractories
BEHR-MANNING: Coated Abrasives • Sharpening Stones • Pressure Sensitive Tapes

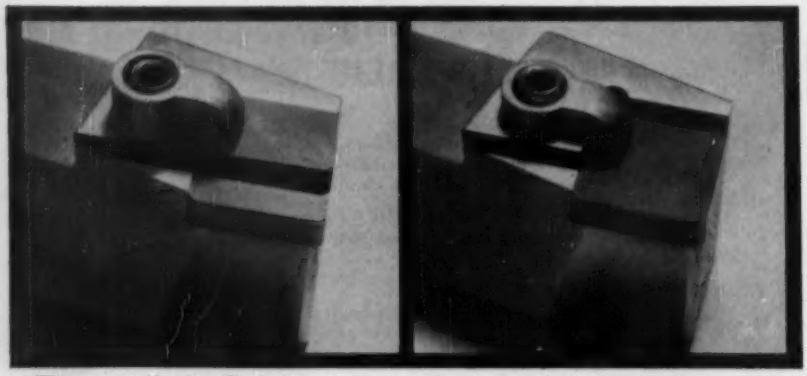
NEW "TURNOVER" INSERTS



You have twice as many cutting edges on these clamp-on, "turnover" inserts. Use all edges on one side, then turn the insert over and use an equal number on the reverse side.

You can index a new Kendex insert in seconds. Simply loosen the sturdy top clamp and turn the insert to a new cutting edge . . . without disturbing the tool setup.

NEW CHIP CONTROL SYSTEM



These new Kendex Tools have an entirely new system of chip control that completely eliminates expensive chip-breaker grinding.

Clamped carbide chip breakers can be removed when not needed. Clamp has sufficient travel to hold insert without chip breaker.

New Kendex* Tooling has 2 big features

COST COMPARISON

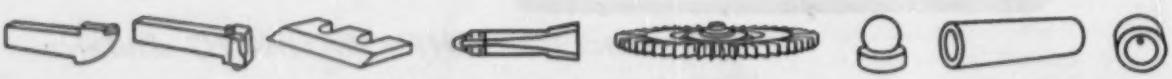
(¾-inch tools required to provide 160 cutting edges)

Standard Brazed Tools		Kendex KBR-12	
Cost of 23 tools	$ 44.62	20 inserts	$20.40
Regrind expense**	61.90	1 holder	6.50
Total cost	$106.52	Total cost	$26.90
Cost per edge	66.5¢	Cost per edge	16.8¢

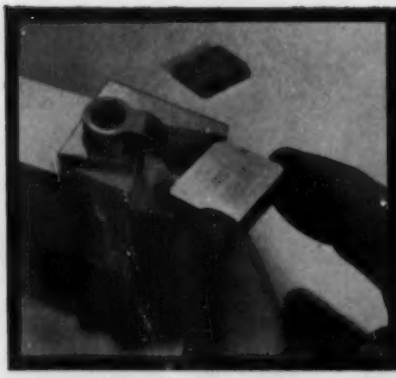
**Six grinds per too.

Total Kendex Savings $79.62

*Registered Trademark

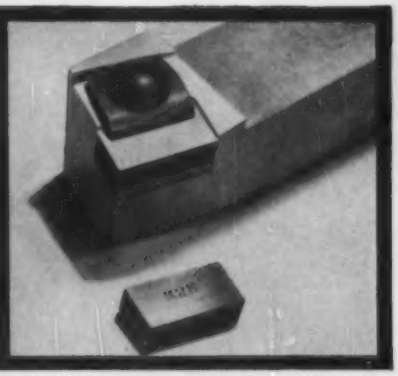


MINING, METAL AND WOODWORKING TOOLS WEAR AND HEAT-RESISTANT PARTS ABRASION, CORROSION-RESISTANT

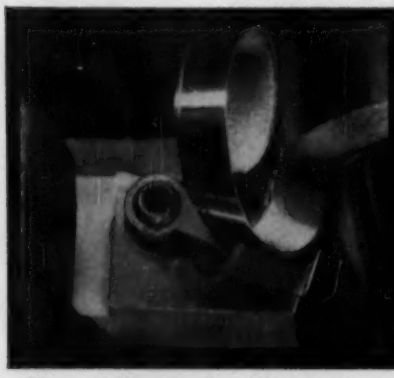


Each replacement insert fits accurately into the rugged, heat-treated shank, with the cutting edge perfectly aligned for use. No complex mechanism to adjust or fail.

For Standard Tools: "Regular" inserts (corner radii, top, and bottom surfaces ground) and "Precision" inserts (all surfaces ground) are available in square and triangular shapes.



For Heavy-Duty Tools: Standard molded blanks ground only on the corner radii for lowest possible cost per cutting edge. These blanks index within plus or minus 0.005 inch.



The carbide chip breakers on these tools have the widest effective range of application of any mechanical chip breakers known.

An indication of their effectiveness can be obtained from the two illustrations above. At left, 0.014 inch feed; at right, 0.036 inch feed—using same tool.

Kendex Heavy-Duty Tools have rigid, spring clamps which serve as chip deflectors. These inexpensive clamps are easily replaced.

to help you cut machining costs

A series of clamp-on, "turnover" inserts and a new system of chip control are helping users of this new Kendex Tooling slash tool cost per cutting edge by completely eliminating expensive grinding operations.

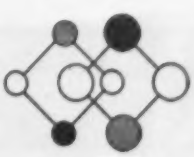
Two tools, the Standard and the Heavy-Duty, are designed to use the new Kendex "turnover" inserts which have cutting edges on not one, but *both* sides. Use twice the number of cutting edges before replacing these cost-cutting, "throw-away" inserts. And, the new top-clamp tool design enables you to index them in less time than ever before.

New Kendex Tooling not only eliminates regrinding of inserts, but the grinding of chip breakers as well. Standard sizes are equipped with replaceable, carbide chip breakers which can be removed, if desired. Heavy-Duty sizes are fitted with rigid, inexpensive spring clamps which serve as chip deflectors.

This combination of new "turnover" inserts and new system of chip control, plus the new top clamp for rapid indexing, is cutting tool costs on all types of machining operations wherever it is used.

See the cost comparison chart (*left*) and judge for yourself. This comparison indicates the *average* cost reduction that users have realized from this new Kendex Tooling. Call your Kennametal representative for a demonstration or write for additional information. KENNAMETAL INC., Latrobe, Pa. A-28

PARTS PERCUSSION AND IMPACT PARTS



INDUSTRY AND
KENNAMETAL
...Partners in Progress

Yoloy reduces body weight, increases payload

THE YOLOY FAMILY

High in resistance to corrosion, shock and vibration, easy to fabricate, easy to weld.

YOLOY
(Nickel-Copper)
Low Alloy High Strength Steel

YOLOY E
(Nickel-Chrome-Copper)
Low Alloy High Strength Steel

YOLOY C
(Chrome-Copper)
Corrosion Resistant Steel

Above: Trucks with Perfection Special Contractors' Type Body—all fabricated from Yoloy Steel.

YOLOY IS AVAILABLE in sheets, plates, strip, pipe, mechanical tubing, bars, shapes and cold finished bars.

Here's another fabricator who finds it profitable to use Youngstown's low-alloy high-strength steel. The Perfection Steel Body Co., Galion, Ohio, summarizes its experience with Yoloy Steel as follows:

"The physical properties of Yoloy are such that lighter gauges used in the construction of dump bodies result in considerable weight reduction and thereby provide increased payloads. Yoloy's corrosion resisting qualities provide the additional advantage of lending longer life to the equipment".

Youngstown

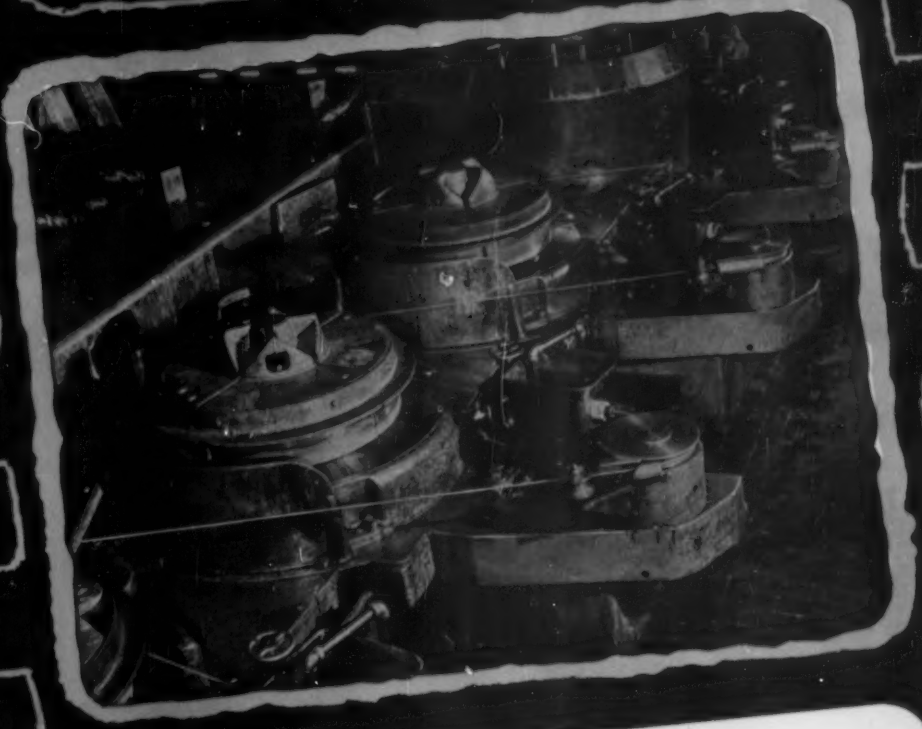
QUALITY YOUNGSTOWN SERVICE

THE YOUNGSTOWN SHEET AND TUBE COMPANY Manufacturers of Carbon, Alloy and Yoloy Steel

General Offices: Youngstown, Ohio - Export Office: 500 Fifth Avenue, New York 36, N. Y.

SHEETS - STRIP - PLATES - STANDARD PIPE - LINE PIPE - OIL COUNTRY TUBULAR GOODS - CONDUIT AND EMT - MECHANICAL TUBING - COLD FINISHED BARS - HOT ROLLED BARS - BAR SHAPES - WIRE - HOT ROLLED RODS - COKE TIN PLATE - ELECTROLYTIC TIN PLATE - RAILROAD TRACK SPIKES

telling the story of 'dag' dispersions



Dry-Film Lubricants Solve these High-Temperature Problems

In Wire-Drawing — 'dag' Colloidal Graphite lessens die wear, assures uniform wire dimensions. *In Forging* — by pre-treating dies with 'Aquadag', a dispersion of colloidal graphite in water, scaling and sticking are minimized, die life is lengthened. *In Stretch-Forming* — 'dag' Colloidal Graphite reduces tearing and rippling, eliminates seizing on the die. *In Piercing* — piercers, punches, and similar tools, are provided with a non-galling, self-lubricating film; die life is extended.

Dispersions of 'dag' Colloidal Graphite in oils, water, volatile hydrocarbons, and resin-solvent combinations, form remarkably slick, durable, *dry lubricating films*. Applied by spraying, painting, or dipping, they won't gum up or break down *at any temperature you are likely to encounter*.

To find out more about the advantages of these remarkable dry-film lubricants, write *today* for Bulletin No. 426-A5.

Dispersions of molybdenum disulfide are available in various carriers.

We are also equipped to do custom dispersing of solids in a wide variety of vehicles.

dag DISPERSIONS®

Acheson Colloids Company, Port Huron, Mich.

...also ACHESON COLLOIDS LIMITED, LONDON, ENGLAND

try dag resin-bonded dry films for permanent lubrication

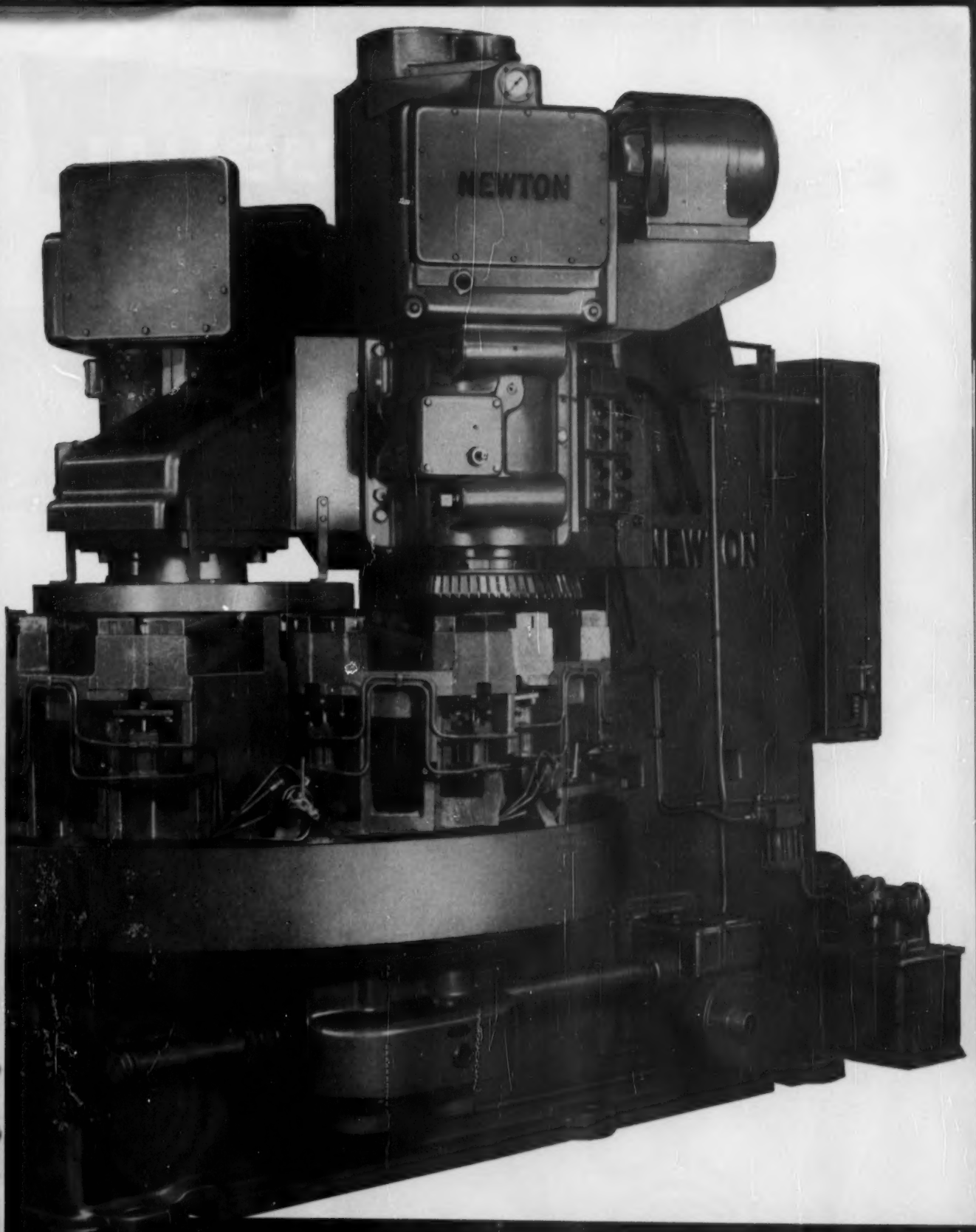
Multiple Milling

Where you have work pieces to be milled on two sides, you can mill both sides on NEWTON VERTICAL ROTARIES in the time required to mill only one side by using double-row fixtures.

This 76 Inch NEWTON VERTICAL ROTARY with double-row fixtures continuously roughs and finish mills two sides of a piece in one pass under the cutters. The fixtures (hydraulically operated) automatically open and close as the table turns.

CONSOLIDATED MACHINE TOOL

Wholly owned subsidiary of Farrel-



CORPORATION, ROCHESTER, N. Y.

Birmingham Company, Incorporated

the UNUSUAL
CINCINNATI

is NORMAL for CINCINNATI SHAPERS

Stress relieving this massive gear required unusual rigidity of table and cross slide, and accurate starting and stopping of the shaper.

Some money making Cincinnati features:

- Electro Magnetic Clutch and Brake.
- 50 P.S.I. automatic lubrication.
- Full control of all machine functions at operator's position.
- Solid, extended ram ways and many other features.

Write for Catalog N-6

Photos courtesy Coeur d'Alene Hardware & Foundry Company, Wallace, Idaho.

THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

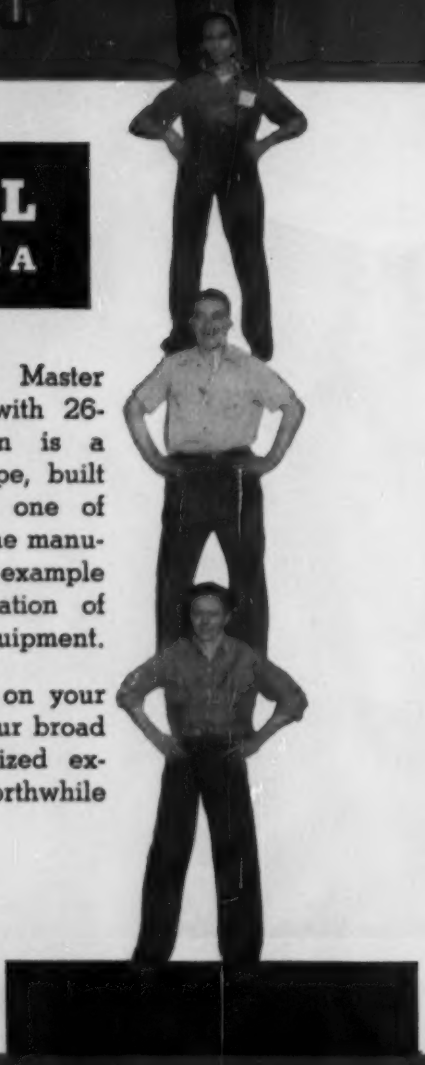
CINCINNATI

FOR 80 YEARS **CINCINNATI**
BICKFORD DRILLING MACHINES
HAVE EFFECTED SAVINGS
IN THE PLANTS OF AMERICA

THE MOST POWERFUL
RADIAL DRILL IN AMERICA

This standard 12-foot Master Super-Service Radial with 26-inch diameter column is a specialized portable type, built to suit the needs of one of America's largest turbine manufacturers. Here is an example of the correct application of modern cost-cutting equipment.

Let us work with you on your drilling problems, for our broad line and long specialized experience can effect worthwhile savings for you.

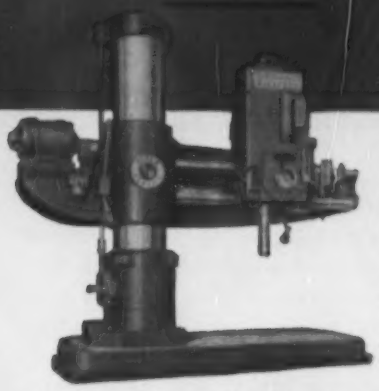


CINCINNATI
BICKFORD

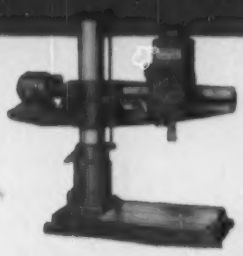
The right
Cincinnati BICKFORD
will do your job better

YOU CAN SELECT FROM
the extensive variety of sizes and types of drilling machines . . . developed over a period of
80 YEARS OF SPECIALIZATION

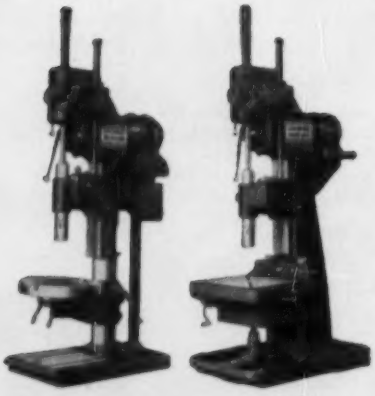
The SUPER SERVICE Master Radial Drill is built in 7′ to 12′ arm lengths and in 22″ and 26″ diameter columns. This machine has 36 speeds and 18 feeds powered by motors from 20 to 40 HP. The most powerful radial drill built.



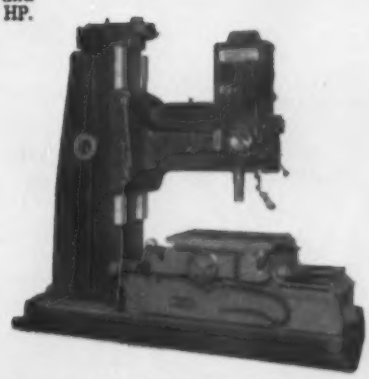
The 36-speed 18-feed SUPER SERVICE Radial Drill is furnished in 13 different standard sizes, ranging from 3′ to 8′ arm lengths and 11″ to 19″ diameter columns. Driving motors are 7½ to 20 HP.



The 9″ Diameter Column SUPER SERVICE Radial Drill, designed for fast, easy handling, is built in either a 3′ or 4′ arm length with 9 speeds and 4 feeds powered with a 3 HP driving motor.



The SUPER SERVICE General Purpose Round or Box Column Upright Drilling Machines are furnished in 21″, 24″ and 28″ sizes. From 9 to 12 speeds and 4 to 9 feeds. The machines are powered by either 3, 5, or 7½ HP motors.



The new SUPER SERVICE Precision Drilling Machine is especially suited to operations in conjunction with the Bullard Spacer for interchangeable production without the delay and expense of costly jigs and special tooling.

The SUPER SERVICE Direct Drive Uprights have the adaptability of general purpose drilling machines but simplified for mass production. They are furnished in 21″, 24″ and 28″ sizes with 3, 5, 7½ or 10 HP driving motors.

What users say!

This booklet is a record of savings in many plants—and is of interest to all users of drilling machines. If you desire a copy please write for "80-year Anniversary Booklet".

RADIAL AND UPRIGHT DRILLING MACHINES

THE CINCINNATI BICKFORD TOOL CO.

Cincinnati 9, Ohio, U.S.A.

SHELBY SEAMLESS TUBING
helps Caterpillar build machines

THIS year Caterpillar Tractor Co. celebrates 50 years of crawler tractor manufacture—half a century of progressive development and outstanding success. During this period, Caterpillar-built products have become world-famous for their unfailing dependability under all conditions of service.

We are proud of the fact that throughout the years Caterpillar has confidently used Shelby Seamless Tubing for many of the vital parts that keep hard-working Caterpillar-built machines on the job.

Super-rugged equipment calls for super-strong materials. That's why you'll find USS Shelby Seamless Mechanical Tubing being used for so many heavy-duty applications. Its great strength, complete uniformity, and extreme dimensional accuracy make Shelby Seamless the ideal mechanical tubing for the fabrication of machine parts subject to bruising performance and long wear.

Available in a wide range of diameters, wall thicknesses, various shapes and steel analyses, Shelby Seamless Tubing is produced to exacting standards by the world's largest manufacturer of tubular steel products. Contact our engineers for recommendations. They will be happy to help you apply Shelby Seamless Mechanical Tubing to your specifications.

NATIONAL TUBE DIVISION
UNITED STATES STEEL CORPORATION, PITTSBURGH, PA.
(Tubing Specialties)
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

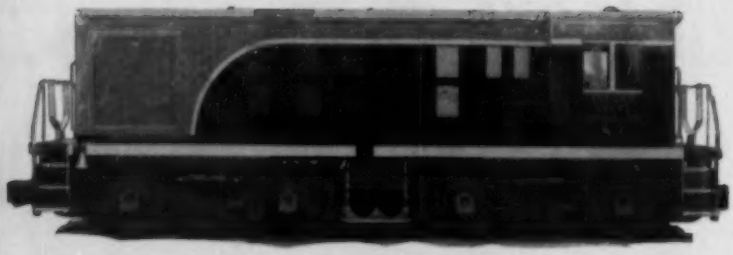
in more than 100 vital parts famous for performance

USS **SHELBY SEAMLESS MECHANICAL TUBING**

WALLS WITHOUT WELDS

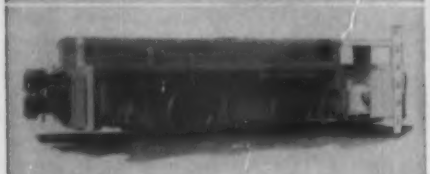
UNITED STATES STEEL

We Build DAVENPORT LOCOMOTIVES SPECIAL to Meet STEEL MILL Operating Conditions



This SPECIAL STEEL MILL Davenport Diesel Electric Locomotive was built for the Inland Steel Company. It is 100-Ton, 0-4-4-0, 36" Gauge, Equipped with Caterpillar D-397 500 H. P. Engine and Four G. E. Motors.

100 Ton, 0-4-0, Davenport Diesel Electric, 56½" Gauge, equipped with 2 Cummins NB5 engines.



Davenport 25-Ton, 0-4-0, Diesel Electric, 56½" Gauge, built for low clearance, equipped with GE 6065 engine.

50-Ton, 0-4-0, Davenport Diesel Electric, 36" Gauge, equipped with 2 Hercules DFXD engines.

Narrow Clearances • Low Clearances • Sharp Curves and Narrow Gauges are Over-come by DAVENPORT Designing.

DAVENPORT LOCOMOTIVES *are available in*

STEAM
STEAM STORAGE
DIESEL *with* **TORQUE CONVERTER** *or* **ELECTRIC** *or* **MECHANICAL DRIVE**

PORTER "Davenport Built" **LOCOMOTIVES**

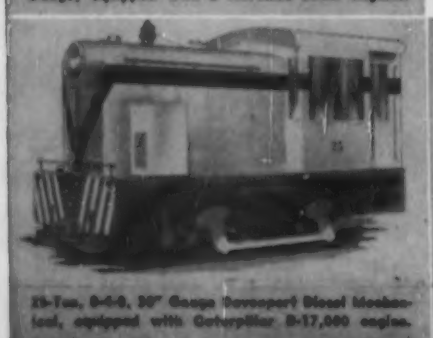
Many Davenports of various types — standard and special — have gone into service for major producers of American steel. Each has possessed design and specification characteristics which suit them to meet the conditions peculiar to the plant in which they were to operate — conditions typical of many American steel mills.

We invite inquiries from steel and allied industries where rail transport is vital. To analyze your requirements and submit responsible recommendations will be a privilege. Our experience in manufacturing more than 12,000 locomotives for varied duties qualifies us to serve you.

Complete Information on Request

DAVENPORT BESLER CORPORATION
Davenport Locomotive Works
DAVENPORT, IOWA, U.S.A.

Cable Address
"BROSITES"



25-Ton, 0-4-0, 30" Gauge Davenport Diesel Mechanical, equipped with Caterpillar D-17,000 engine.

35-Ton, 0-4-0, 56½" Gauge, Davenport Diesel Electric, equipped with Cummins [illegible] engine.

Davenport Diesel Mechanical, 12-Ton, 0-4-0, 40" Gauge, equipped with Caterpillar D-318 engine.

A COMPLETE LINE OF
Engineered
ELECTROPLATING AND POLISHING PROCESSES,
EQUIPMENT & SUPPLIES
PLATEMANSHIP
Your H-VW-M combination—of the most modern testing and development laboratory—of over 80 years experience in every phase of plating and polishing—of a complete equipment, process and supply line for every need.
H-VW-M PRODUCTS AND PROCESSES
Abrasives
Acid Pump
Ammeters
Analyses, Solutions
Anodes
Anode Bags
Anode Containers, Ball
Aprons, Platers'
Balls, Steel Eclipse
Barrels, Burnishing
Barrels, Tumbling
Barrels, Plating
Basket, Scrap Anode
Baskets, Dipping
Brighteners, Addition Agents
Brushes
Buffs
Cathode Rockers
Chemicals, Plating
Chrome Spray Floats
Cleaners
Compositions
Conveyors, Full-Automatic
Conveyors, Semi-Automatic
Cooling Coils
Crocks, Earthenware
Degreasing Solvents
Dryers
Exhaust Fans
Filters
Felt
Fluxes
Generators
Gloves, Platers'
Glue, Belgrade
Heaters
Heating Coils
Hose
Insulating Steam Joints
Klinch Grain Cement & Thinner
Kote-Masq
Kote-Rax, Grade M
Lathes
Lime
Moisture Extractor Equipment
Oxidizing Liquid
Pails, Rubber
Paint, Tygon Plastic
Periodic Reserve Control
Pipe & Fittings, BN
Purification Supplies
Rectifiers
Salt Fog Corrosion Testing Equip.
Sisalin Sections
Bias Sisalweev Sections
Standard Plating Solutions
Tank Rheostats
Tanks
Temperature Controllers
Voltmeters
Wheels
Wrap-Rax Tape
Continuous Strip and Wire Cleaning, Plating and Pickling Lines
1429
HANSON-VAN WINKLE-MUNNING CO. MATAWAN, NEW JERSEY, U.S.A.
H-VW-M
HANSON-VAN WINKLE-MUNNING COMPANY
MATAWAN, NEW JERSEY
Plants: Matawan, New Jersey • Anderson, Indiana • Grand Rapids, Michigan
SALES OFFICES: ANDERSON (IND.) • BALTIMORE • BELOIT (WISC.) • BOSTON • BRIDGEPORT • CHICAGO
CLEVELAND • DAYTON • DETROIT • GRAND RAPIDS • LOS ANGELES • LOUISVILLE • MATAWAN
MILWAUKEE • NEW YORK • PHILADELPHIA • PITTSBURGH • PLAINFIELD (N. J.) • ROCHESTER • ST. LOUIS
SAN FRANCISCO • SPRINGFIELD (MASS.) • UTICA • WALLINGFORD (CONN.)

round the clock with

CF&I-WICKWIRE WIRE

Here, in these scenes, we take you through a typical day in the life of John Q. Citizen . . . showing you the extent to which CF&I-Wickwire Wire enters into the everyday activities of his home and business life.

7:00 A.M.—BEDROOM. John's day starts with the ringing of his alarm clock. There's wire in the mattress and bedspring. In the lampshades and drapery hooks. Bobby pins, safety and common pins in his wife's dressing table—to mention just a few.

7:15 A.M.—NURSERY. Here's the crib from which young John helps the alarm clock to rouse his dad. No less than nine different kinds of wire, go into its making. His toys and his tricycle—even the zippers on his clothes make use of CF&I-Wickwire Wire.

7:30 A.M.—KITCHEN. Let's inspect the kitchen. In the range and the refrigerator there are wire racks. The kitchen utensils, wire strainers, electric mixer, the egg slicer, the toaster, and dozens of other appliances all use CF&I-Wickwire Wire in their construction.

8:55 A.M.—OFFICE BUILDING. John never stops to think about it but he rides up to work on dependable elevator cable. Without this indispensable wire product—much of it made of CF&I-Wickwire Wire—modern buildings would be unable to function.

9:00 A.M.—OFFICE. Here we are, inside John's office. Where is the wire? All around us. Paper clips inside the desks. Springs inside the telephones and the typewriters—even under John's swivel chair. Staples, coat hangers and ring binders are also made of wire.

3:00 P.M.—FACTORY. Let's accompany John on a trip to his firm's nearby factory. The premises are inclosed by a wire fence. Inside, we find wire mesh cloth used as machinery guards. Metal processing belts made of woven wire. Plus springs of every variety.

For the Wire You Require—Check CF&I-Wickwire

CF&I-WICKWIRE WIRE

THE COLORADO FUEL AND IRON CORPORATION

WICKWIRE SPENCER STEEL DIVISION • Atlanta • Boston • Buffalo • Chicago • Detroit • New Orleans • New York Philadelphia • **THE COLORADO FUEL AND IRON CORPORATION** • Albuquerque • Amarillo • Billings • Boise • Butte Denver • El Paso • Ft. Worth • Houston • Lincoln (Neb.) • Los Angeles • Oakland • Oklahoma City Phoenix • Portland • Pueblo • Salt Lake City • San Francisco • Seattle • Spokane • Wichita

2772

8:30 A.M.—GARAGE. A lucky fellow, John rides to work every day in his car. This is his garage. Notice that it has a smooth-operating overhead door. What makes it swing up? A large spring. And—you guessed it—it's made from CF&I-Wickwire Wire.

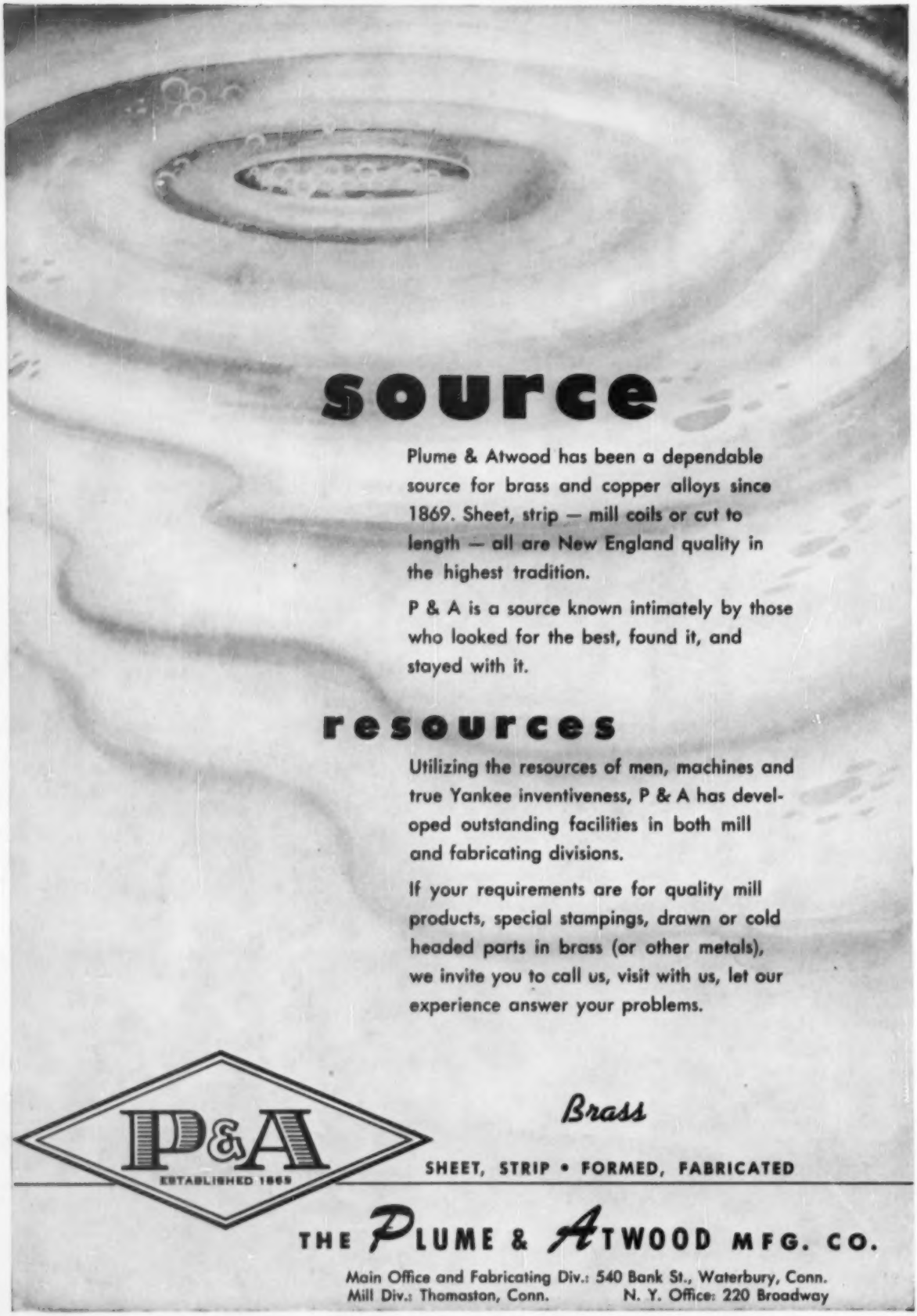
8:35 A.M.—AUTOMOBILE. CF&I-Wickwire Wire contributes much to the comfort and efficiency John gets from his car. There's wire in the springs of the seat and back cushions. Also under the hood in the valve springs and the starter spring.

8:45 A.M.—HIGHWAY. Notice the ribbon of concrete over which John's car rides smoothly to its destination. Many people, just like John, fail to realize that what holds it together is Welded Wire Reinforcement Fabric—another important wire product.

6:00 P.M.—HOME. This is John's house. Note that a sturdy chain link fence protects his privacy and property. On his windows you'll find insect wire screening. Springs on his doors. TV Guy Wire on the roof. Flower bed borders in his garden.

8:00 P.M.—WORKSHOP. John is a "do-it-yourself" man. This is his workshop. He probably doesn't realize it but the screw driver he's using is made from wire. Also the wire brush on his buffing wheel. And, of course, indispensable nails and screws.

9:30 P.M.—LIVING ROOM. Here, we see John relaxing in the comfort of his living room, where wire is used in many forms. Upholstery springs in his furniture. Wire in his TV set. Lampshade wire and picture cord wire. Even the fireplace screen is made of wire.



source

Plume & Atwood has been a dependable source for brass and copper alloys since 1869. Sheet, strip — mill coils or cut to length — all are New England quality in the highest tradition.

P & A is a source known intimately by those who looked for the best, found it, and stayed with it.

resources

Utilizing the resources of men, machines and true Yankee inventiveness, P & A has developed outstanding facilities in both mill and fabricating divisions.

If your requirements are for quality mill products, special stampings, drawn or cold headed parts in brass (or other metals), we invite you to call us, visit with us, let our experience answer your problems.

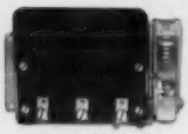
P&A
ESTABLISHED 1869

Brass

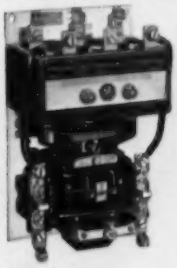
SHEET, STRIP • FORMED, FABRICATED

THE PLUME & ATWOOD MFG. CO.

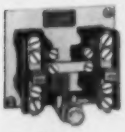
Main Office and Fabricating Div.: 540 Bank St., Waterbury, Conn.
Mill Div.: Thomaston, Conn. N. Y. Office: 220 Broadway



1 **Manual Disconnect** with cabinet door handle safety interlock.

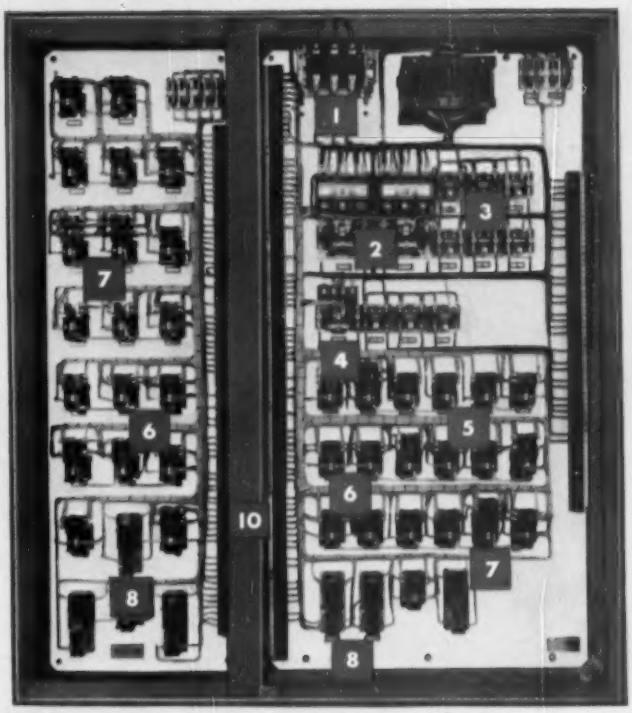


2 **Large Solenoid Starter** with overload relays.



3 **Overload Relays**

11 **Master Station**



10 Automatic Control Panel for Hoern & Dilts boring machine shown below.

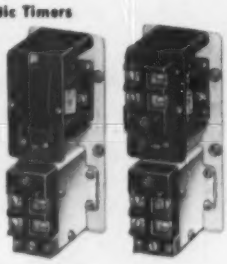
9 **Oiltight Push Buttons**

With mushroom head push button and oiltight diaphragm for oily locations.

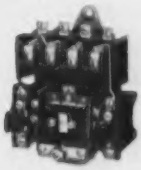
With selector for 3-way Automatic-Off-Hand control.

8 **Pneumatic Timers**

Easily adjustable from 1/6 second to 3 minutes. Available in a large variety of On-Delay or Off-Delay contact combinations. Also listed for direct current.



4 **Small Size 1 Solenoid Starter**



Complete line includes 8 sizes—from Sizes 0 to 7.

5 **Four-pole Relay**

In any combination of normally open or normally closed contacts.

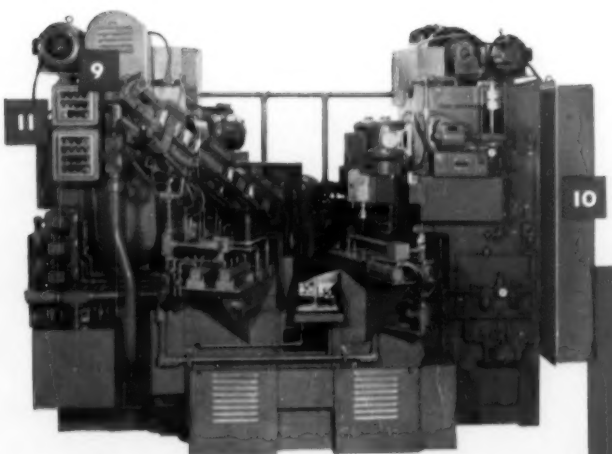
6 **Universal Relay**

Has normally open and normally closed contacts. Merely change connections.

7 **Eight-pole Relay**

8-Pole relay with 4 N.O. contacts.

How to build trouble-free motor control panels



Hoern & Dilts Model BH-16-35 Indexing Type Precision Turning and Boring Machine equipped with A-B controls and oiltight push buttons.

Special control panels are commonly used with modern production machines. They are the "brains" of the machine—they must be dependable. Therefore, they must be assembled with trouble-free components . . . like the Allen-Bradley starters, relays, timers, and control stations shown on this page. The Allen-Bradley reputation for QUALITY is your assurance of trouble-free operation.

Send for the latest edition of the 120-page Allen-Bradley Handy Catalog . . . it's a veritable handbook of modern automatic and manual motor controls. Write, today.

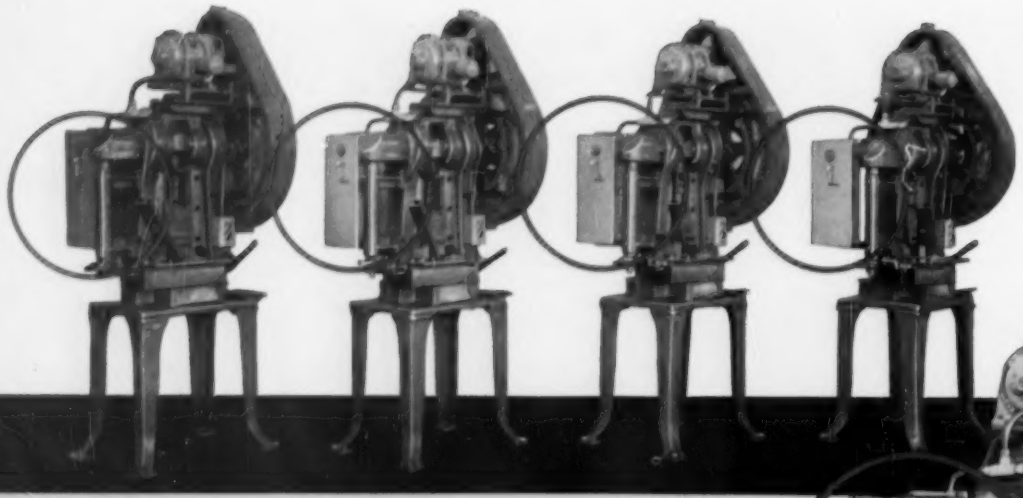
Allen-Bradley Co.
1316 S. Second St.
Milwaukee 4, Wis.

In Canada—
Allen-Bradley Canada Ltd.
Galt, Ontario

A-B

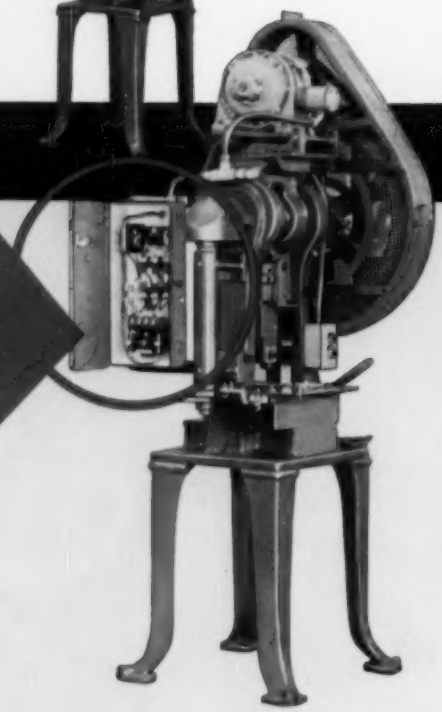
ALLEN-BRADLEY
QUALITY
MOTOR CONTROL

1-354-A



Waterbury Farrel Stamping Presses equipped with A-B Combination Starters.

DISCONNECT SWITCH — FUSES — SOLENOID STARTER
. . . all combined in ONE ENCLOSURE . . .



Alert machinery manufacturers recognize the sales advantage of equipping their motor-driven machines with these compact combination starters. They combine disconnect switch, fuses, and solenoid starter in a single enclosure . . . and they provide this added safety feature . . . it is impossible to open the starter cabinet until the disconnect lever is moved into the OFF position. The combination starter provides a clean, finished appearance—a sales asset for any machine tool. And—the installation cost is less!

Bulletin 712 Combination Starter with Manual Disconnect Switch and Fuses

Bulletin 713 Combination Starter with I-T-E Circuit Breaker

Standardize on A-B COMBINATION STARTERS . . . for Compact and Safe Motor Control

Allen-Bradley combination starters come in two general types—Bulletin 712 with a manually operated disconnect unit (with or without fuse clips)—and Bulletin 713 with an I-T-E instantaneous circuit breaker.

See the neat, compact starter installations on the machines, above. Streamline your machines to give them a "New Look" with Allen-Bradley combination starters. Write, today, for the A-B 120-page Handy Catalog.

Allen-Bradley Co., 1316 S. Second St., Milwaukee 4, Wis.

In Canada—Allen-Bradley Canada Limited, Galt, Ont.

A-B

ALLEN-BRADLEY

BULLETIN QUALITY 712-713

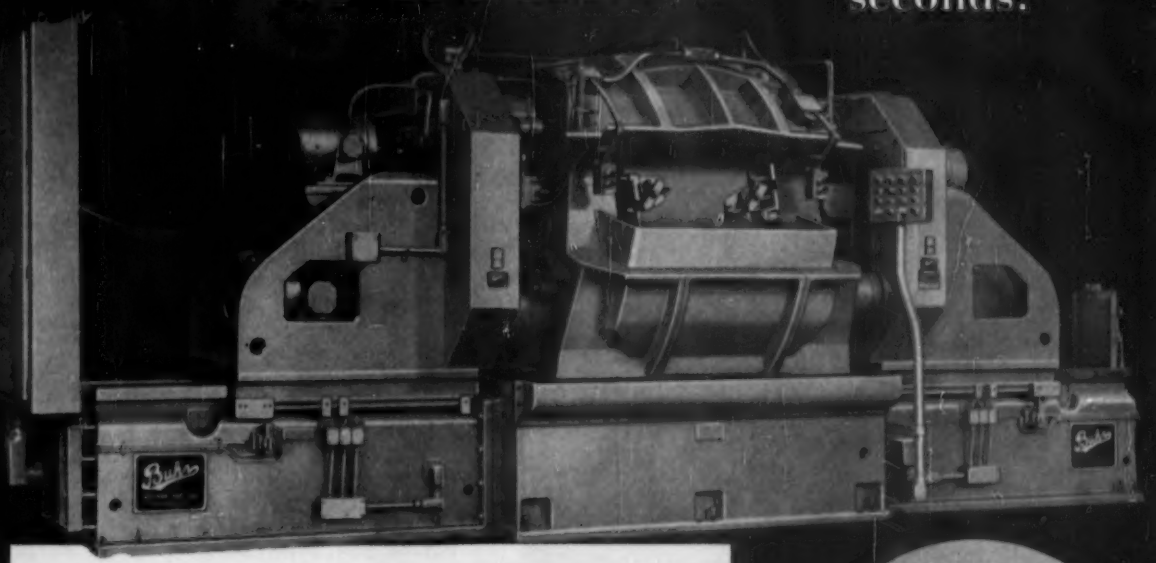
COMBINATION STARTERS

1-552

Buhr

SPECIAL...

Drills, chamfers and taps two rear axle drive shafts every 22 seconds!



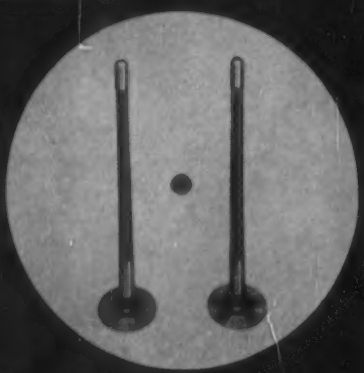
This Trunnion-Type Buhr Special drills, chamfers (both sides of holes) and taps 328 pieces an hour at 100% efficiency.

Two parts are loaded per fixture on this 6-station, 2-way Buhr Special.

Hydraulic clamping-and-unclamping is completely automatic.

Cluster heads — incorporated in a master gear box — are featured, as with all Buhr Trunnion-Type Machines.

On Buhr Specials, all parts are held to tolerances and are completely interchangeable. All component assemblies are located by precision-bored dowels. These Standard Buhr Features assure precision alignment!



See the complete range of Buhr Specials. Send for catalog or let one of our sales executives call on you.

BUHR MACHINE TOOL CO.

252 GREEN STREET, ANN ARBOR, MICHIGAN

Solidly Engineered . . . Precision Built for World's Leading Manufacturers

Buhr

MULTIPLE-SPINDLE HIGH PRODUCTION MACHINERY

SHOWING FOR THE FIRST TIME - - -

A New Addition to the Dempster-Dumpster System of Low Cost Bulk Materials Handling

Now you can have either of two types of Dempster-Dumpsters in the fastest, most efficient and lowest cost method of bulk materials handling ever devised.

IN THIS MODERN, low cost system, one truck-mounted Dempster-Dumpster picks up, hauls and empties, or sets down intact, one loaded detachable Dempster-Dumpster Container after another, regardless of design or size, handling bulk materials of practically every description.

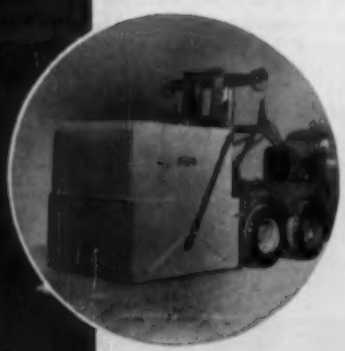
The new Dempster-Dumpster Type DTLF offers several desirable features along with all the economies provided by the Type LFW. These features include: (1) Improved load distribution with container carried in more forward position between wheel centers. (2) Extreme high dumping in cases where it is desired. (3) Vertical pick up of loaded container. (4) Container, loaded or empty, is always in horizontal plane in carrying position. Automatic locking device for positive rigidness of container while in carrying position is, of course, provided.

TREMENDOUS SAVINGS WITH THE DEMPSTER-DUMPSTER SYSTEM HAVE BEEN PROVED BEYOND QUESTION.

One truck-mounted Dempster-Dumpster, operated by only one man, the driver, serves scores of containers of various capacities up to three times greater than the average dump truck. You eliminate trucks standing idle . . . eliminate re-handling of materials . . . eliminate loading crews. You increase efficiency, sanitation and good plant-keeping.

Containers range from 2 to 21 cu. yds. capacity for use with recommended type Dempster-Dumpsters. Each container is designed to suit the materials to be handled—be they trash, rubbish, liquids, dust, bulky, light or heavy. Many leading plants, in almost every type of industry, have found it indispensable after installation. Its proved savings alone justifies an investigation of its potential value in your plant now. Write to us today for complete information. Manufactured and sold exclusively by Dempster Brothers, Inc.

The photo at left illustrates the amazing ability of the Type DTLF Dempster-Dumpster for high dumping. The three photos below show the Pick Up, Haul and Dumping action, hydraulically controlled from cab.



DEMPSTER

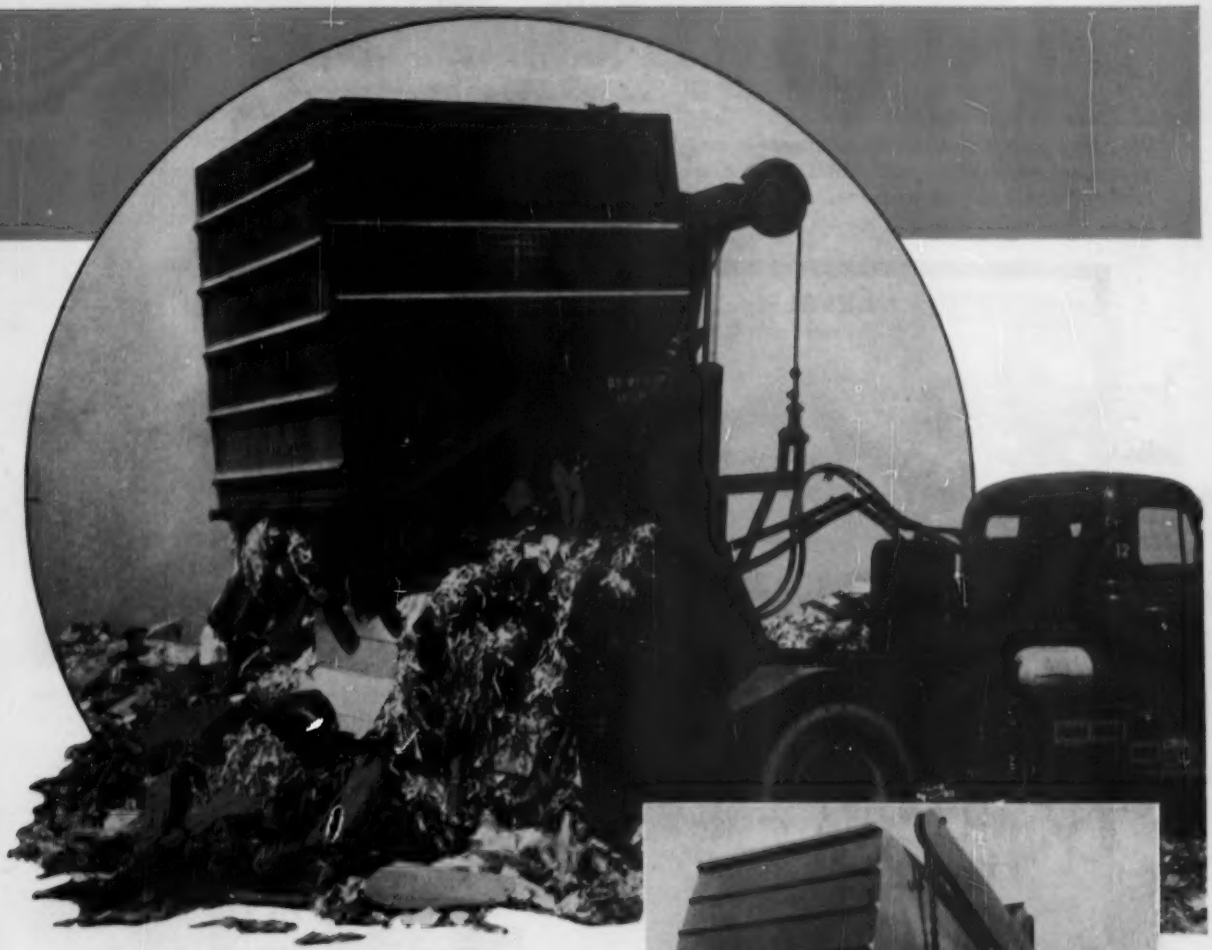


Photo above shows the new Dempster-Dumpster Type DTLF dumping 8 cu. yds. of rubbish. At right you see the Type LFW with load in carrying position. Dempster-Dumpsters are available in capacities capable of handling up to 38,000 pound payloads.

One Truck-Mounted
Dempster-Dumpster Handles Scores
of Containers... All Designs... All Sizes

B R O T H E R S 415 N. Knox, Knoxville 17, Tennessee

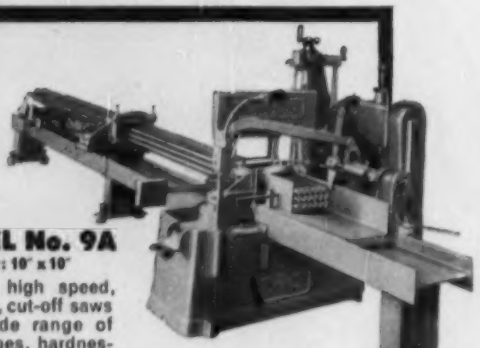
WHAT DO YOU WANT IN A METAL-CUTTING SAW?
—ECONOMY, SPEED, VERSATILITY, CAPACITY

Whatever your individual requirements in metal-cutting equipment, MARVEL has it. MARVEL builds nine basic types of metal sawing machines, each available with a choice of modifications and special accessory equipment.

Your local MARVEL sawing engineer is competent to study your cut-off and metal sawing problems, and to make recommendations as to the most advanced methods and equipment.

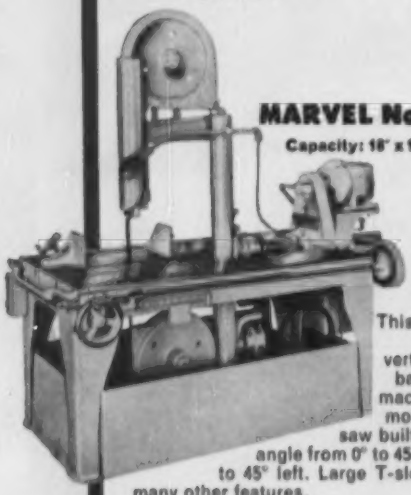
MARVEL No. 2/MI
Capacity: 6" x 6"

Dependable, low-priced, dry-cutting, light duty shop saws. Available in two capacities, 6" x 6" or 4" x 4", belt or motor drive, stationary or portable.



MARVEL No. 9A
Capacity: 10" x 10"

Automatic high speed, heavy duty, cut-off saws handle wide range of sizes, shapes, hardnesses and grades. Also with 6" x 6" capacity (No. 6A), or in single cut types (No. 9, No. 6).



MARVEL No. 8
Capacity: 18" x 18"

This universal, advancing vertical blade, band sawing machine is the most versatile saw built. Cuts any angle from 0° to 45° right to 0° to 45° left. Large T-slot bed and many other features.

MARVEL No. 18
Capacity: 18" x 18"

Universal, hydraulic, heavy duty roll stroke hack saw. Cuts off largest and toughest bars and billets; easily, rapidly and accurately. Trims die faces for resinking, does shanking of die blocks, etc. Also available in 24" x 24" capacity (MARVEL No. 24).

Write for catalog

MARVEL High-Speed-Edge Hack Saw Blades

Unbreakable, composite saw blades with fastest-cutting, longest-lasting high speed steel edge integrally welded to a tough unbreakable body, permit maximum speeds and feeds on any hack sawing machine. Permit tauter tensioning —increase accuracy. Outlast all other blades.

MARVEL High-Speed-Edge Hole Saws have strength not only for portable drills, but for use on drill presses, lathes, etc. Sold by leading industrial distributors.

MARVEL *Metal Cutting* **SAWS**
Better Machines-Better Blades

ARMSTRONG-BLUM MFG. CO. 5700 W. Bloomingdale Ave., CHICAGO 39, U.S.A.

What shape is a quality fastener?

Here is a handful of ELASTIC STOP® nuts. Each has ESNA's familiar red locking collar . . . is self-locking and vibration-proof. Each is a readily assembled, one-piece unit. Each provides positive protection against thread corrosion . . . prevents liquid seepage along bolts. Each is made from the finest of raw materials. Each is exactly controlled as to finished dimensions, class of thread fit and finish. Each is now in use on critical applications, with a record for uniform high quality that is unmatched.

Most of them are standard parts. Some originated as the result of a specific request for ESNA's help with an important fastening problem.

Isn't it logical to call on us with your next fastening problem?

ELASTIC STOP NUT CORPORATION OF AMERICA

ESNA

ROLLPIN TRADEMARK

Elastic Stop Nut Corporation of America
Dept. H62-177, 2330 Vauxhall Road, Union, N. J.
Please send the following free fastening information:

☐ ELASTIC STOP nut bulletin ☐ Here is a drawing of our product. What self-locking fastener would you suggest?

Name_____ Title_____

Firm_____

Street_____

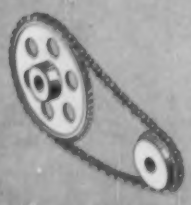
City_____ Zone____ State____

First choice of cost-wise buyers

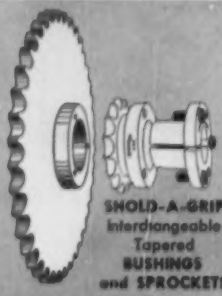
BOSTON Gear

6562 "off the shelf" STANDARD STOCK TRANSMISSION PRODUCTS

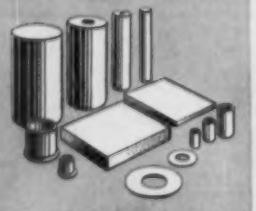
STOCK GEARS: Spur • Racks • Miter • Bevel • Helical • Worms and Worm Gears



SPROCKETS and CHAIN
For drives ranging from fractional to 40 hp

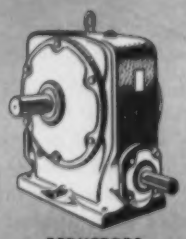


SHOLD-A-GRIP Interchangeable Tapered BUSHINGS and SPROCKETS
Fit sprockets up to 24" pitch dia. to any shafts ½" to 3" by 16ths

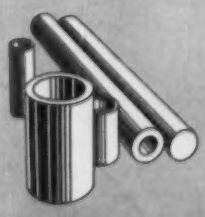


BOST-BRONZ oil-impregnated BEARINGS

RATIOMOTORS
Motorized Speed Reducers
32 types—1/20 hp to 3 hp



REDUCTORS
Standardized Speed Reducers
.005 hp to 36 hp



Certified BEAR-N-BRONZ Solid Bronze BEARINGS

PILLOW BLOCKS

COUPLINGS

UNIVERSAL JOINTS

BALL BEARINGS

Send for your copy

STANDARDIZED TO SIMPLIFY YOUR MAINTENANCE AND DESIGN
Standardized, completely interchangeable, precision Gear Products, they meet practically all needs, for maintenance replacements, for machinery built for plant use, for drive assemblies in products you make.

IN STOCK NEARBY—NO DELAYS AND COSTLY DOWNTIME
In emergencies, can be delivered immediately, saving downtime.

FIRST QUALITY AT LOWER COST
BOSTON GEAR quality control gives you unequalled precision, finish, and performance. Compare costs — the savings will surprise you.

SELECTION ADVICE FROM SPECIALIST
Information is quickly available from your Distributor's factory-trained specialist, or BOSTON GEAR Field Engineer when desired.

PRODUCTION QUANTITIES— REDUCTORS and RATIOMOTORS
BOSTON GEAR Engineering Dept. will help you design custom built, high-efficiency, low-cost Ratiomotors or Reductors into your product. Send prints and specifications. A qualified Field Engineer will call at your request.

WIDEST SELECTION
BOSTON GEAR Catalog lists 102 Product Groups — includes 30 pages of engineering data. Get a copy from your BOSTON GEAR Distributor or write Boston Gear Works, 72 Hayward St., Quincy 71, Mass.

54-AP4

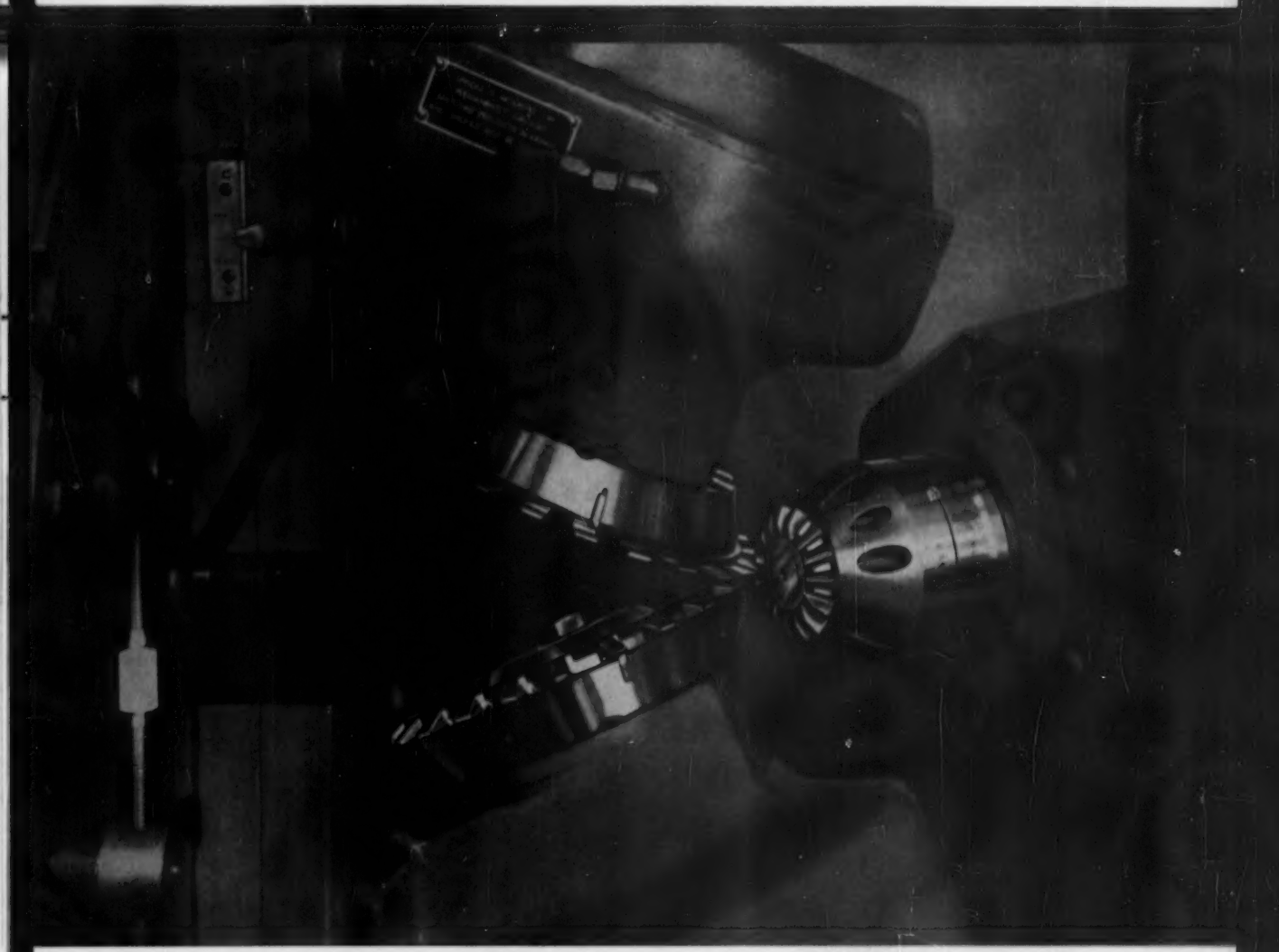
At 96 Authorized BOSTON Gear Distributors . . . a $10,000,000 stock for "off-the shelf" deliveries

Look under "Gears" in the Yellow Classified Section of your Telephone Directory for Distributor nearest you

ORDER FROM YOUR NEARBY

BOSTON Gear

DISTRIBUTOR—at Factory Prices



How to multiply production of straight bevel CONIFLEX® gears and pinions *by as much as 500%*

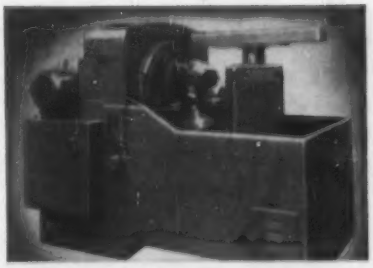
You can do it with the new No. 104 Straight Bevel CONIFLEX Generator.

The two interlocking disc-type cutters, with 24 blades each, *complete a gear in one rapid operation.*

This is the key to the remarkable performance of this new Gleason machine which achieves production rates up to 5 times as fast as any previous generator. In addition, a new generating method insures high efficiency, excellent finish, and maximum cutter life.

The range of capacity, and the ease of setup, make the No. 104 Straight Bevel CONIFLEX Generator ideal for jobbing.

Calculations have been reduced to a minimum and can be done long hand or with slide rule.



The No. 104 Straight Bevel CONIFLEX Generator completes gears up to 8½" diameter and 1⅞" face width, and from 20 to 3 DP.

We will be glad to send a bulletin giving further details on request.

® Straight bevel gears with localized tooth bearing.

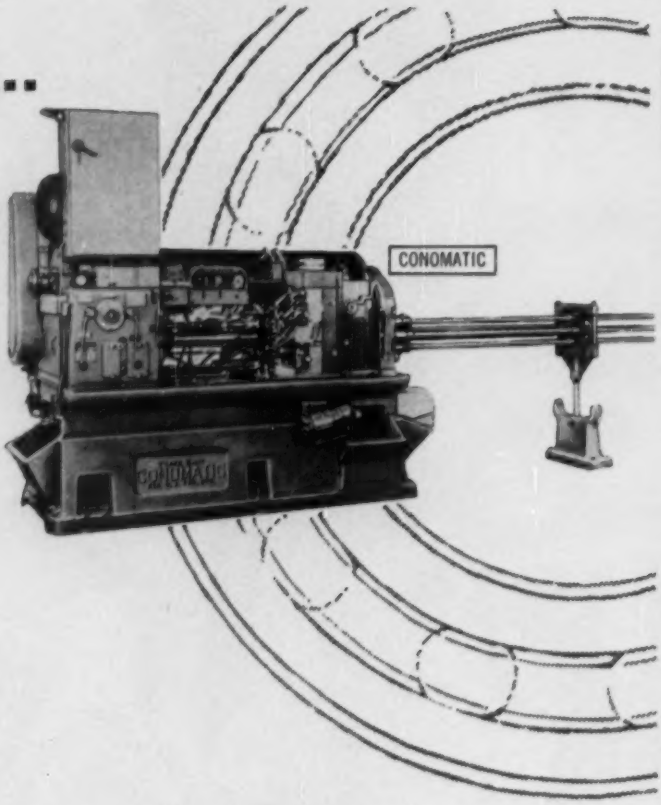
GLEASON WORKS

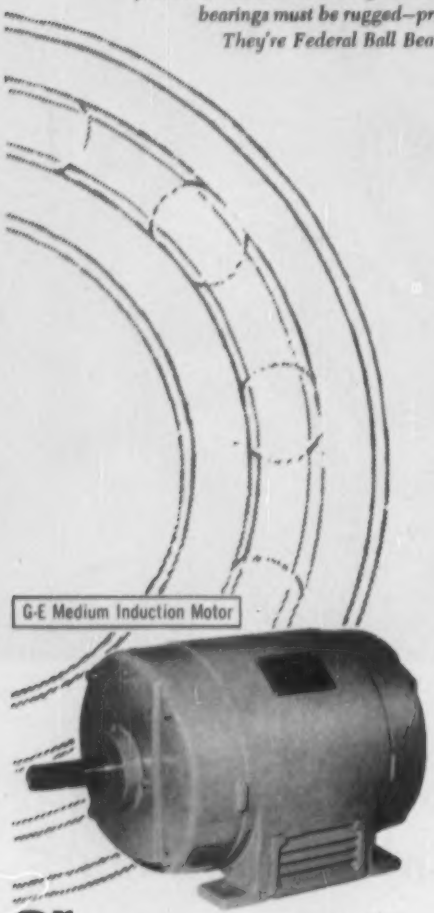
Builders of bevel gear machinery for over 85 years

1000 UNIVERSITY AVE., ROCHESTER 3, N. Y.

to feed a tool...

Automatic feed transmissions on newest type Conomatic Six Spindle Bar Machines have to deliver a powerful, steady tool drive under heavy loads for precision carbide machining. Feed shaft bearings must be rugged—precise. They're Federal Ball Bearings.





or quiet a motor...

The smooth hum of today's precision-built motors whispers the efficiency of every part. Here, too, Federal Ball Bearings quietly perform their continuous, anti-friction assignment—whatever the size—whatever the type.

so much of industry *turns* on FEDERAL ball bearings

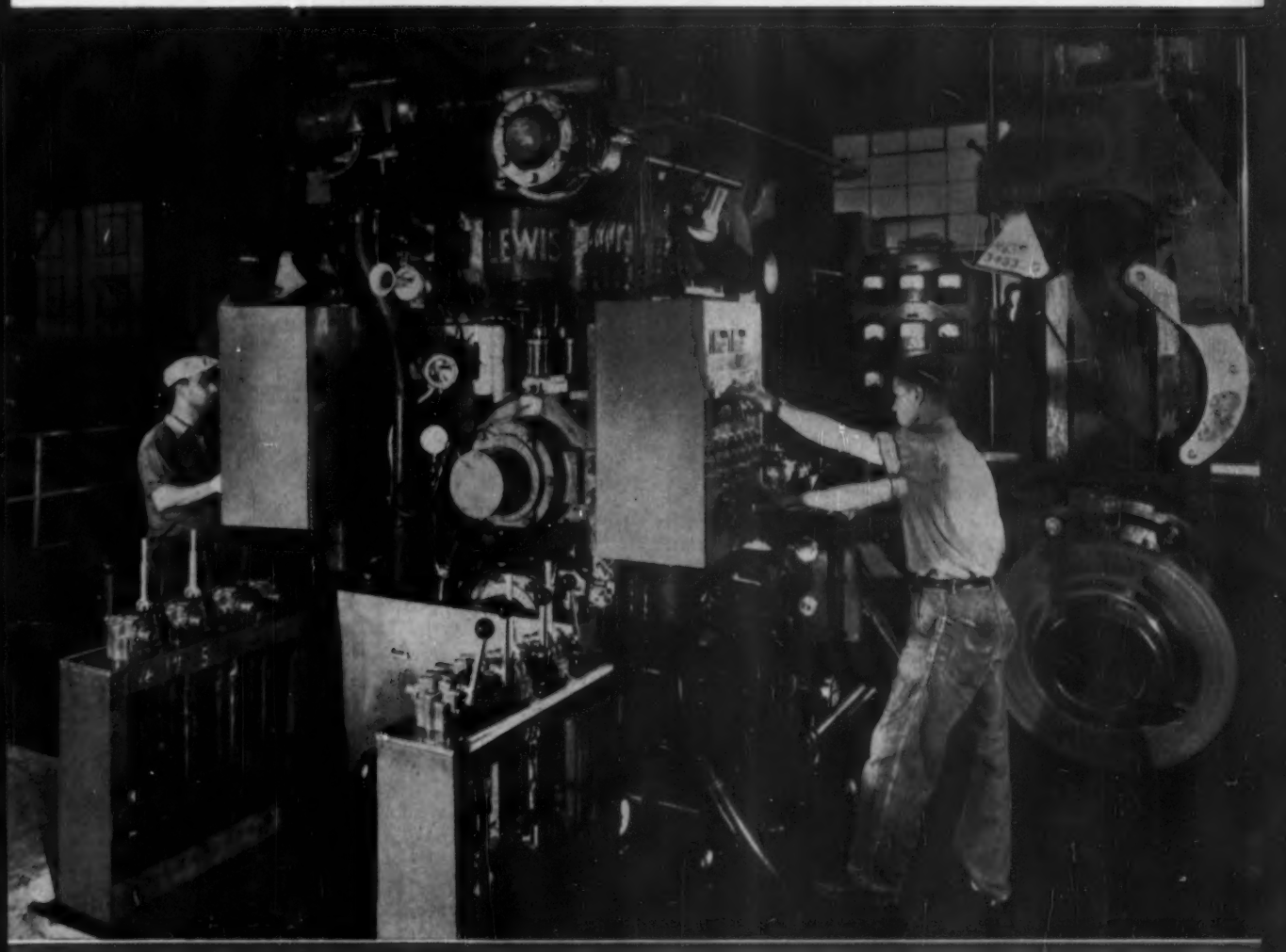
Machine tools—motors—or moving vans! At plant, home, machine shop! On the highway, on the farm—where there's anti-friction work to be done, you'll find Federal Ball Bearings quietly and efficiently on the job. Hundreds of types—12,000 sizes—produced by this 50-year-old manufacturer of ball bearings... exclusively.
When Federal Ball Bearings are a part of so many things you *use*, shouldn't they be a part of the things you *make*?

Just off the presses! *175 pages of ball bearing and engineering data*—FEDERAL'S NEW CATALOG! *Just drop us a line and we'll speed you your copy.*

THE FEDERAL BEARINGS CO., INC. • POUGHKEEPSIE, N. Y.

Federal BALL BEARINGS

One of America's Largest Ball Bearing Manufacturers



...new mill performs multiple operations on large variety of re-roll items

With this new Lewis Combination 2-high/4-high Reversing Mill you can economically handle a large variety of re-roll items in small tonnage quantity.

Designed and built by Lewis, the mill can cold reduce steel strip, skin pass, temper roll and gauge correct . . . either light or heavy gauge material . . . at speeds from 600 to 1800 fpm.

When operated as a 4-high mill, using 4½ and 16 x 20 rolls, it has driven back up rolls . . . each roll having its own individual motor without mechanical tie-in. When operated as a 2-high mill, using 21 x 18 rolls, the same motors and drive are used.

First of its kind ever built, this new Lewis Mill makes an ideal investment for any plant that requires a versatile mill to profitably handle a variety of re-roll products.

Whether you may need a mill of this type or some other kind, our experienced engineers and modern manufacturing facilities are always available to design and build sturdy mill equipment to meet your specific requirements.

LEWIS COMBINATION 2 HIGH 4 HIGH REVERSING MILL

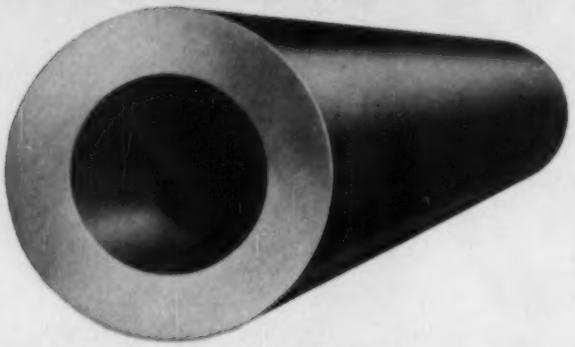
BLAW-KNOX COMPANY • LEWIS MACHINERY DIVISION
PITTSBURGH 22, PENNSYLVANIA

BLAW-KNOX

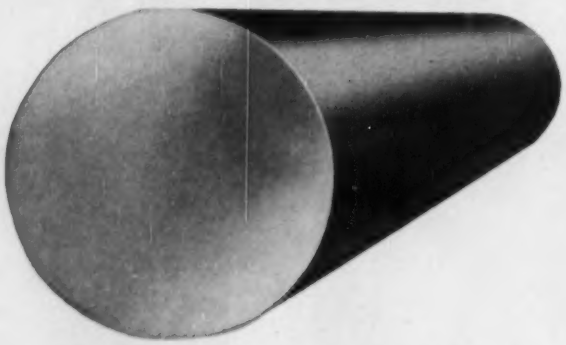
LEWIS PRODUCTS: Two-High Mills • Three-High Mills • Four-High Mills • Strip Mills • Bar, Billet and Structural Mills • Plate Mills • Rod Mills • Coilers • Tables • Shears • Pinion Stands • Gear Drives • Roll Lathes

When you make hollow parts . . .

Start with seamless tubing



instead of bar stock



Save steel, machining time!

WHEN you make hollow parts from bar stock, you waste time boring the center hole—you waste steel because you have to throw away the chips you bore out. Why not do it the easy, economical way? Start with Timken® seamless tubing. The hole's already there! Finish boring is often the first production step. You cut machining time—get more parts per ton of steel.

With Timken seamless tubing, your machine tools are more productive. Screw machine stations normally used for drilling can be released for other jobs. You get added machine capacity without additional machines.

To make sure you save even *more* steel, our engineers will study your problem and recommend the most economical tube size for your hollow parts job, guaranteed to clean up to finish dimensions.

You also get the highest internal quality with Timken seamless tubing. The piercing process by which it's made is basically a forging process. Result: a uniform spiral grain flow for greater strength and a refined grain structure which brings out the best quality of the metal. And the Timken Company's rigid control keeps the quality uniform from tube to tube and heat to heat. The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING

material handling INFORMATION

for Progressive Production Executives

Euclid Cranes
Widely Accepted by Discriminating Industrialists Since 1910
The EUCLID CRANE & HOIST Co. Cleveland 17, Ohio
BRIDGE AND END
EUCLID ELECTRIC CRANES
PRODUCTS of SPECIALISTS

● Here is a new catalog featuring Euclid Cranes which have been the popular choice of discriminating purchasers for many years.

It not only illustrates and describes the features responsible for their outstanding performance and wide acceptance but also shows the application of electric cranes to industries of various types and sizes.

Explained also are the features and adaptability of various kinds of bridges, trolleys, controls, etc., to specific handling problems.

Everything considered, this is in fact, the kind of information with which every production executive will want to be familiar.

Write on your letterhead or use the convenient coupon for your copy.

THE EUCLID CRANE & HOIST CO.
1361 CHARDON RD., CLEVELAND 17, OHIO

MAIL COUPON FOR YOUR COPY

Date_____

THE EUCLID CRANE & HOIST COMPANY
1361 Chardon Road, Cleveland 17, Ohio

Gentlemen:
Please send us a copy of the new catalog featuring EUCLID CRANES

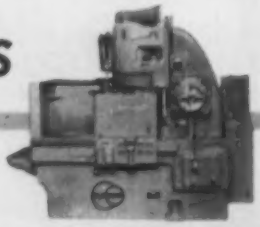
Company_____

Address_____

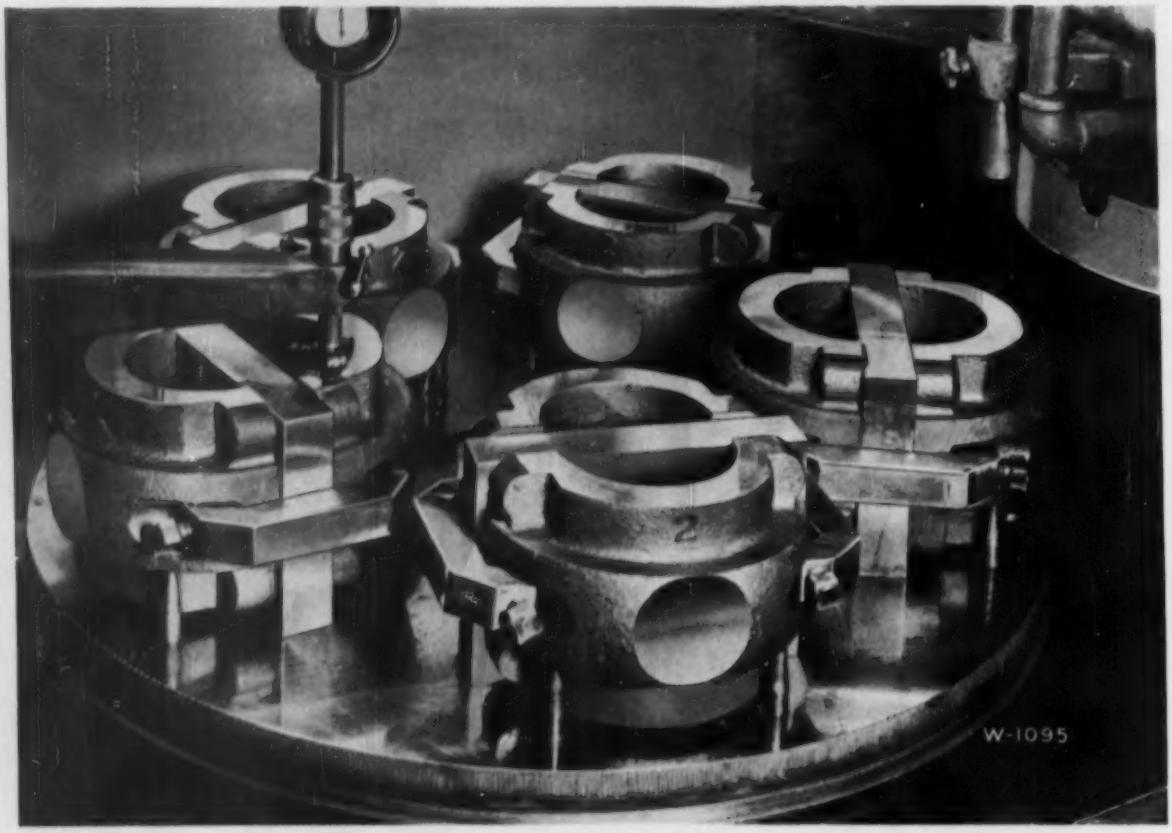
Direct to the attention of_____

_____
TITLE

IT PAYS



TO PUT IT ON A BLANCHARD



The first operation on these cast steel (1504) bearings is to Blanchard grind the parting line to establish locating surfaces.

Then, a No. 18 Blanchard Surface Grinder (shown above), with 36" magnetic chuck, rough grinds the end faces of all five sets in 17 minutes—at an abrasive cost of only 2¢ per piece! This operation provides locating surfaces for additional machining. By using the correct Blanchard wheel* and proper rate of down feed, the wheel dresses itself and removes three cubic inches of cast steel per minute.

The final Blanchard operations include finish grinding both end faces—removing .015" of stock from each end, flat and parallel to ±.001". Each surface is ground in 17 seconds, fourteen pieces to a load, located directly on the magnetic chuck.

**Blanchard Grinders perform best with Blanchard Wheels!*

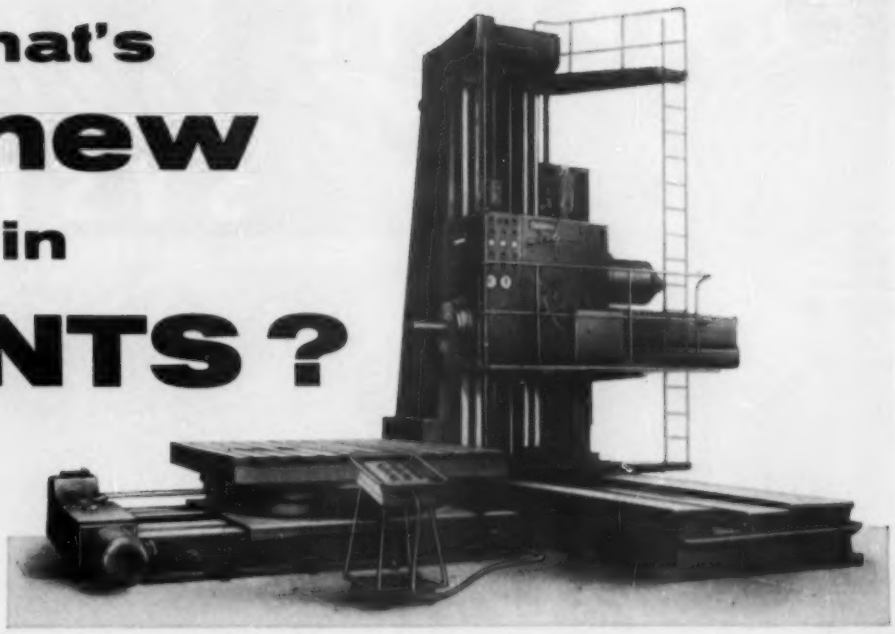
Send for your free copies of "Work Done on the Blanchard", fourth edition, and "The Art of Blanchard Surface Grinding".

PUT IT ON THE BLANCHARD

THE BLANCHARD MACHINE COMPANY

64 STATE ST., CAMBRIDGE 39, MASS., U.S.A.

what's new in GIANTS?



This 8¾" SCHIESS model BF horizontal boring and milling machine . . . Now completely redesigned with many innovations. Here are a few . . .

Two individual drives—gear-drive for roughing, belt-drive for finishing. Belt-drive particularly suited to high-speed machining with carbide tools. New tool clamping device—does away with draw keys, hammers, drifts and binding screws. All spindle-slide movements controlled from easily accessible operating platform (or from pendant station or portable control panel, if desired). Special main-drive belt requires no readjusting. Column, spindle-slide and boring spindle may be adjusted at rapid traverse.

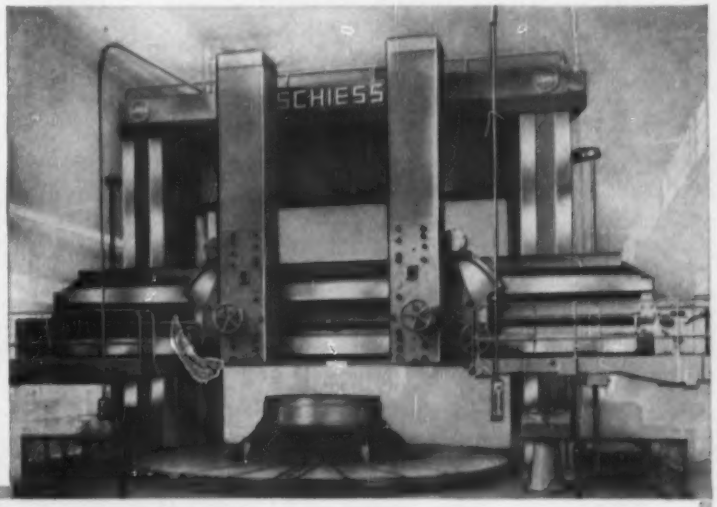
Spindle diameters, 6⅝" to 8⅞". Maximum diameter bored, 59"—faced, 79".

It takes Europe's largest builder of heavy machine tools, Schiess, to turn out giants like these. Parts and service as close as Pittsburgh. And an American Schiess engineer will be happy to help you size up these heavy producers for your heavy production needs. Write for catalogs and complete specifications on all Schiess BF and K models.

This 23 ft. SCHIESS model K vertical boring mill . . .

Look at all these new features—each one a time-saver! Rapid traverse motions with pushbutton control of changeover from feed motion to independent power traverse. Electro-mechanical locking of cross-rail to columns. Fingertip speed control—counter-balanced cross-rail and side-head—completely enclosed swiveling octagon rams—pendant control—automatic lubrication.

Turning diameters in standard sizes range from 8 ft. to 23 ft. (which can handle stock up to 100 tons!). Basic Schiess designs permit extra heavy machines, normally considered specials, to be built to your work diameter and load requirements. Even a diameter of 84 ft.!

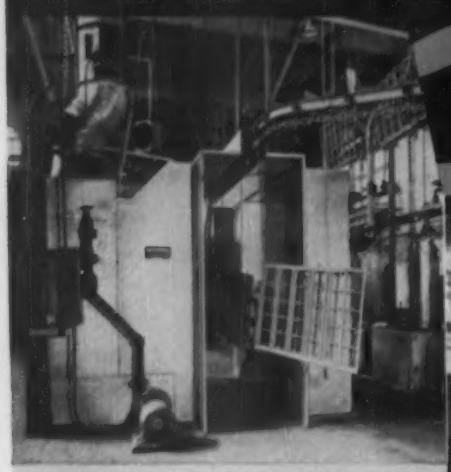


Engineering Division
AMERICAN SCHIESS CORPORATION
38th Street and AVRR, Pittsburgh, Pennsylvania

Sole Distributor
KO KURT ORBAN COMPANY, INC.
34 Exchange Place, Jersey City, N. J.

COMPLETE *Finishing* SYSTEMS

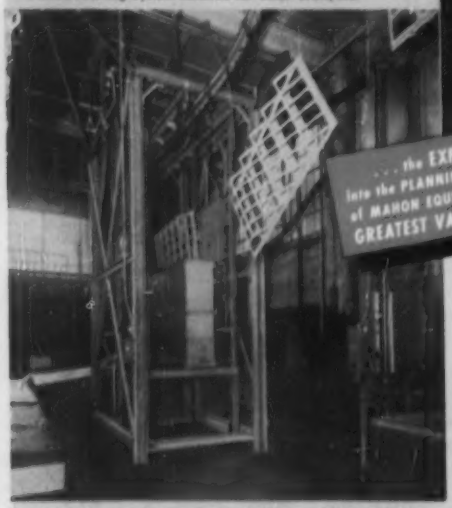
. . . for ENAMELS • LACQUER • PAINT • VARNISH



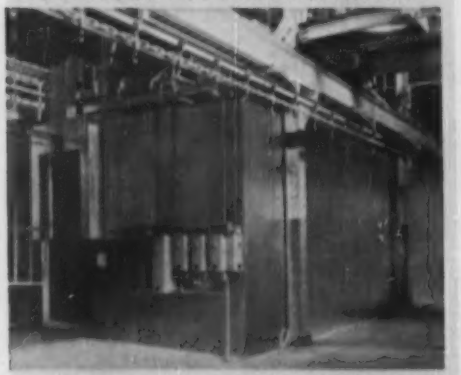
Mahon Hydro-Filter Spray Booth—part of the Complete Mahon Finishing System installed for Color-Craft, Inc.

General view of the Complete Mahon Finishing System at Color-Craft, Inc. Facilities include Six-Stage Metal Cleaning and Rust Proofing Equipment.

. . . the EXPERIENCE that goes into the PLANNING and ENGINEERING of MAHON EQUIPMENT is the item of GREATEST VALUE to YOU!



Mahon Automatic Dip-Coating Machine at Color-Craft, Inc. Dip tanks employed vary in size to meet job requirements.



Mahon Finish Baking Oven—part of the Complete Mahon Finishing System installed for Color-Craft, Inc., Detroit, Mich.

COLOR-CRAFT, Inc. Chooses MAHON EQUIPMENT for High-Quality CONTRACT PAINTING OPERATIONS!

When the Color-Craft organization in Detroit decided to go into the contract painting business, the two most convincing points in selling this painting service to manufacturers were Color-Craft's know-how, backed by over twenty-five years of experience, and new, modern processing and coating equipment and other facilities capable of producing at minimum cost the fine finishes demanded in today's highly competitive market. Color-Craft turned to Mahon for the type of equipment deemed necessary for a successful and profitable operation. Mahon planned, engineered, built and installed a complete finishing system flexible in its cleaning and pre-paint processing of metals and capable of handling the wide variety of shapes and sizes in parts and products encountered in this type of finishing operation. The choice of Mahon Equipment was not only a wise decision, but a logical one in this case, because more automobiles and more home appliances are finished in Complete Mahon Finishing Systems than all other types combined—an indisputable tribute to Mahon's performance in this highly specialized field. If you are contemplating new finishing equipment, you, like thousands of other quality-minded manufacturers, will find that Mahon engineers are better qualified to advise you on both methods and equipment requirements . . . and better qualified to do the all-important planning, coordinating and engineering of equipment—which is the key to fine finishes at minimum cost. You will find also, that Mahon equipment is built better for more economical operation over a longer period of time. Mahon will furnish your complete system on one contract . . . undivided responsibility for the entire job safeguards you against complications which may upset your production plans and subsequent schedules. See Sweet's Plant Engineering File for information, or write for Mahon Catalog A-655.

THE R. C. MAHON COMPANY

HOME OFFICE and PLANT, Detroit 34, Mich. • WESTERN SALES DIVISION, Chicago 4, Ill.

Engineers and Manufacturers of Complete Finishing Systems—including Metal Cleaning, Pickling, and Rust Proofing Equipment, Hydro-Filter Spray Booths, Dip and Flow Coaters, Filtered Air Supply Systems and Drying and Baking Ovens, Cooling Tunnels, Heat Treating and Quenching Equipment for Aluminum and Magnesium, and other Units of Special Production Equipment.

MAHON

THE FERRY CAP
countr-bor
SCREW

A NEW, REVOLUTIONARY DESIGN FOR SOCKET HEAD SCREW APPLICATIONS

OFFERING THESE NOTEWORTHY ADVANTAGES:

1. Takes standard 12-point socket wrench.
2. External wrenching instead of internal.
3. Stronger—more gripping surface.
4. Permits greater wrenching torque.

Packaged goods being readied for distributors

In brief—a quality product which will do everything required of socket head screws—*and more.* For all counterbore applications.

Wherever the Ferry Cap Countr-Bor Screw has been tried, users are enthusiastic—saying that these screws are a service man's dream and the best development in socket screws in recent years. They will help you lick tough assembly problems where socket screws are required.

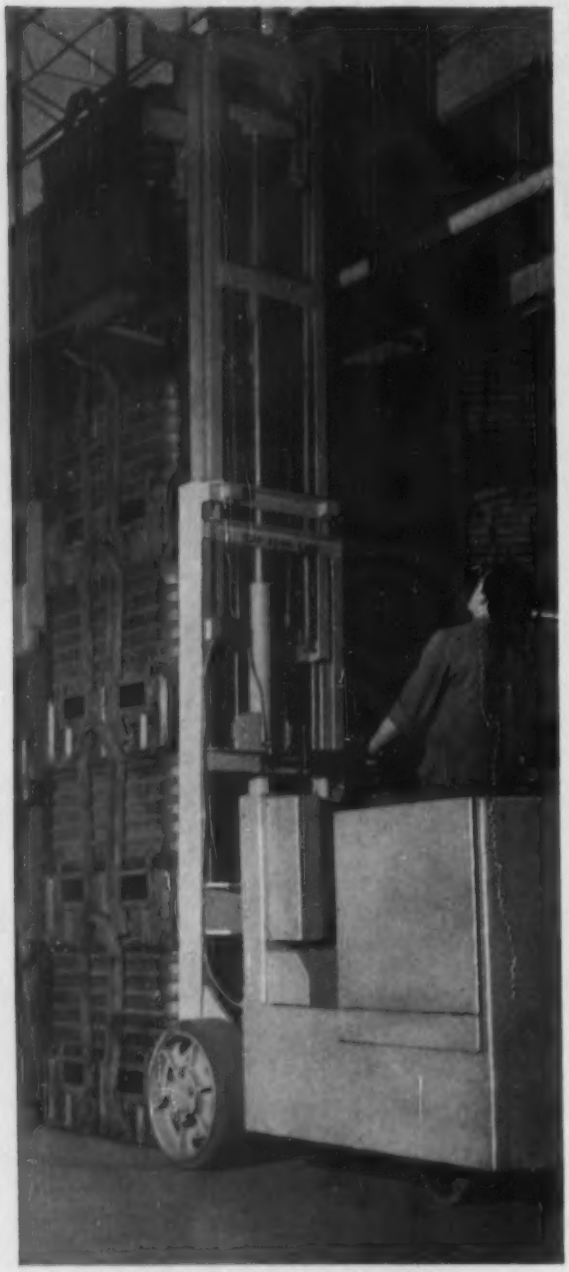
We shall be glad to send samples, prices and complete information promptly upon request.

Ferry Cap Countr-Bor Screws
PATENT APPLIED FOR
MANUFACTURED SOLELY BY

THE FERRY CAP & SET SCREW COMPANY
2157 Scranton Road • Cleveland 13, Ohio

GET "FINGER-TIP" CONTROL, MORE LIFTS PER SHIFT

...with low cost Exide-Ironclad battery power!



ACCURATE STACKING, precise spotting, are essential for fast, safe materials handling. Exide-Ironclad Batteries respond instantly to any power need required for rapid, accurate handling operations. They enable trucks to handle as much load in the last hour of the shift as during the first ...with no unscheduled down time. Lower costs for operation, maintenance, and depreciation make Exide-Ironclads the best power buy—AT ANY PRICE.

THE POSITIVE PLATES are the heart of any battery. Only Exide uses a slotted tube construction. By use of tubes, more active material is exposed to the electrolyte, providing *greater power.* Also, more active material is retained, *giving longer working life.*

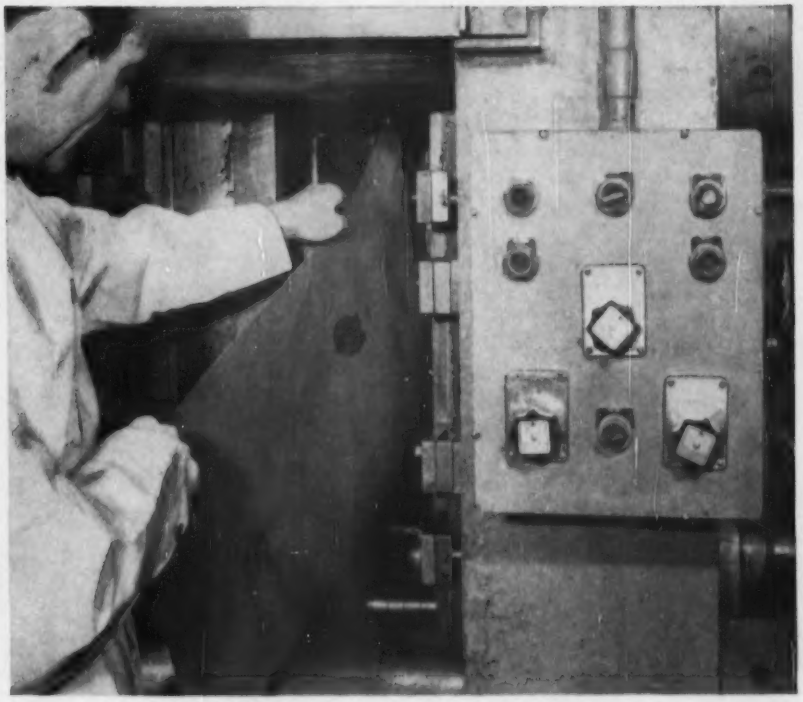
THE NEW THRIFTY HAULER! The improved industrial truck battery. *Non-oxidizing* plastic power tubes assure longest battery life, more capacity in the same space. For full details, call your Exide sales engineer—write for Form 1982 (Installation and Maintenance of Motive Power).

Your best power buy
...AT ANY PRICE!

Exide®
IRONCLAD® BATTERIES

Exide INDUSTRIAL DIVISION, The Electric Storage Battery Company, Philadelphia 2, Pa.

no more costly, messy die-greasing!



How Federal Tool rustproofs a die in seconds. Ferro-Pak sheet inserted in die emits rust-inhibiting vapors from both sides.

New PAPER Rust-Preventive SAVES $200 A WEEK at Federal Tool

Keeping rust from expensive, highly-polished dies is a major problem for plastics molders. But coating dies with grease is a messy, time-consuming job nobody likes. Even after cleaning, machines often run an hour or more molding scrap just to clean out grease stuck in the dies.

Here's how Federal Tool Corporation of Chicago licked the problem. "Instead of grease, we use Cromwell Ferro-Pak rust inhibitor paper," says John L. Nolan, molding division manager. "In machine time and labor alone it saves us $200 a week."

Find out how new, chemically treated Cromwell Ferro-Pak can save *you* money . . . in easier, cleaner maintenance, faster packaging, lighter containers. Conforms with Military Packaging Specification MIL-P-3420. Ask your Cromwell jobber.

Cromwell **FERRO-PAK®**

Clip to your letterhead for FREE SAMPLE

PAPER ENGINEERS FOR INDUSTRY

Cromwell Paper Company · 4803 S. Whipple St. · Chicago 32
Send sample and full information on Ferro-Pak for:

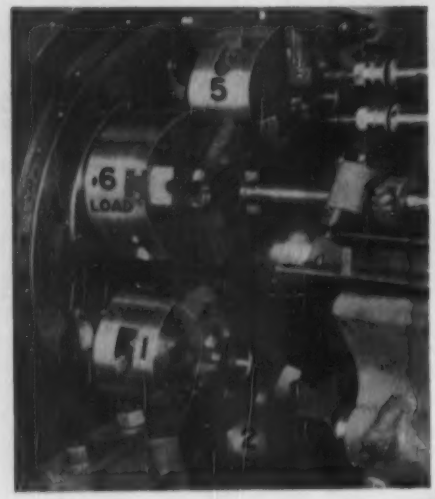
- ☐ cutting maintenance costs
- ☐ cheaper packaging
- ☐ long-term storage
- ☐ "moth-balling" for shutdowns

Other_____

ASK BAIRD ABOUT IT!

HIGH PRODUCTION TOOLING

A BAIRD CASE HISTORY



View of machine from front.

1
Finish turn flange O.D. (3.44″). Rough turn hub dia. Rough face flange and hub.

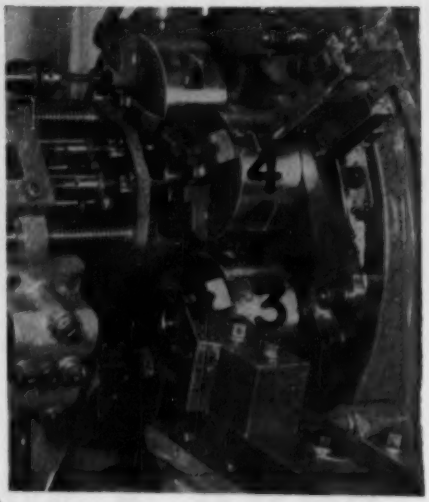
2
Chamfer I.D. Chamfer flange dia. and hub.

3
Finish turn hub, finish face flange and hub.

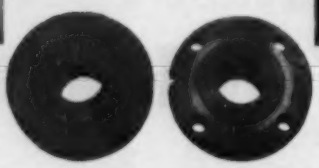
4
Drill and c'sink 4 holes — 23/64″ dia. drill x 29/64″ dia. C'sink, sub land drills. (Work held stationary when drilling.)

5
Tap 4 holes 7/16″ — 14NC — 3. (Work positioned, held stationary, lead screw operated.)

6
Unload and load.



View of machine from rear.



The part . . . before and after machining.

FINISHING A CAST IRON PULLEY HUB...

PRODUCTION
Cycle time 23.12 seconds per piece.
Gross production 155 pieces per hour.

Here's another example of the way a single Baird High Production Machine can be tooled to handle a series of operations ordinarily not considered practical on a single spindle automatic unit. Note that, in addition to the usual concentric operations being performed on this hub, we are drilling, countersinking, and tapping accurately located bolt holes in the hub flange at just two stations in the cycle and at a very satisfactory production rate for the whole operation. Photographs show the tooling and relative simplicity of the set-up.

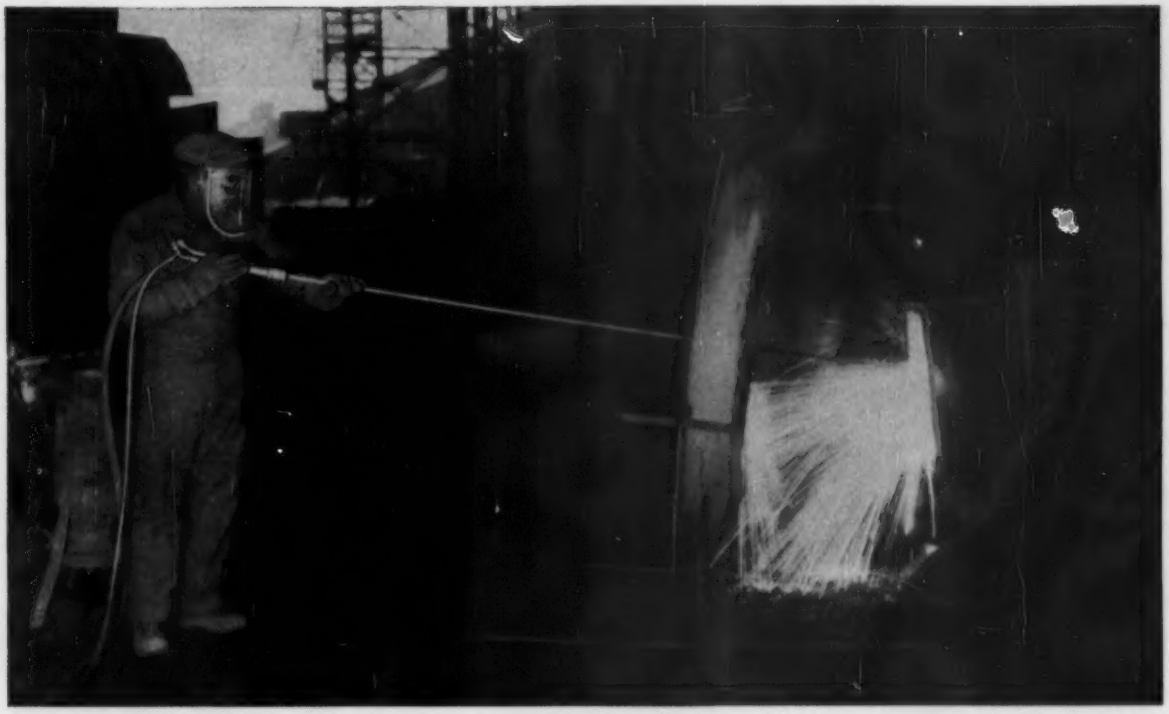
And, as in the case of all Baird No. 76 Chucker installations, this one is conspicuous for smoothness and dependability of everyday performance. Automatic chucking frees operator's hands for efficient, easy feeding. Automatic safeguards prevent damage to work, machine, or injury to operator in case of incorrect loading. Spindle speeds are independently adjusted to best performance of the individual operation.

To step up speeds, quality of work, reduction in costs, check the Baird Chucker. "Ask Baird about it."

1BA53

the BAIRD MACHINE COMPANY
STRATFORD • CONNECTICUT

AUTOMATIC MACHINE TOOLS • AUTOMATIC WIRE & RIBBON METAL FORMING MACHINES • AUTOMATIC PRESSES • TUMBLING BARRELS



Cut Mold Core Cleaning Time 2/3 by Powder-Lancing

Typical conditions of splashed metal, sand, and slag which have penetrated this ingot mold core.

This job was accomplished in 8 hrs., while previous lancing methods required up to 30 hours.

The time required to clean away splashed metal, sand, and slag which have penetrated these ingot mold cores has been cut from 30-hrs. to 8 by powder-lancing.

The speed of powder-lancing enables a steel mill to cut labor costs by more than ⅔, and reduce the consumption of lance pipe to less than ⅓ that ordinarily required.

In powder-lancing, a powdered metal is added to the oxygen lance process which raises its "flame" temperature, and increases the rate of melting or oxidation in the material being lanced.

A powder-lance can pierce holes in many materials that resist a standard oxygen lance. Blast furnace refractory, concrete, cinder blocks, fire brick, aluminum billets, steel and cast iron containing inclusions, and sand and metal incrustations—all yield quickly and easily to powder-lancing.

Powder-lancing is helping to speed production and maintenance in mills throughout the country. LINDE service engineers will be glad to help you determine the latest, most efficient setups for any lance operation. Call your local LINDE representative for more information. Save time and money, call him today.

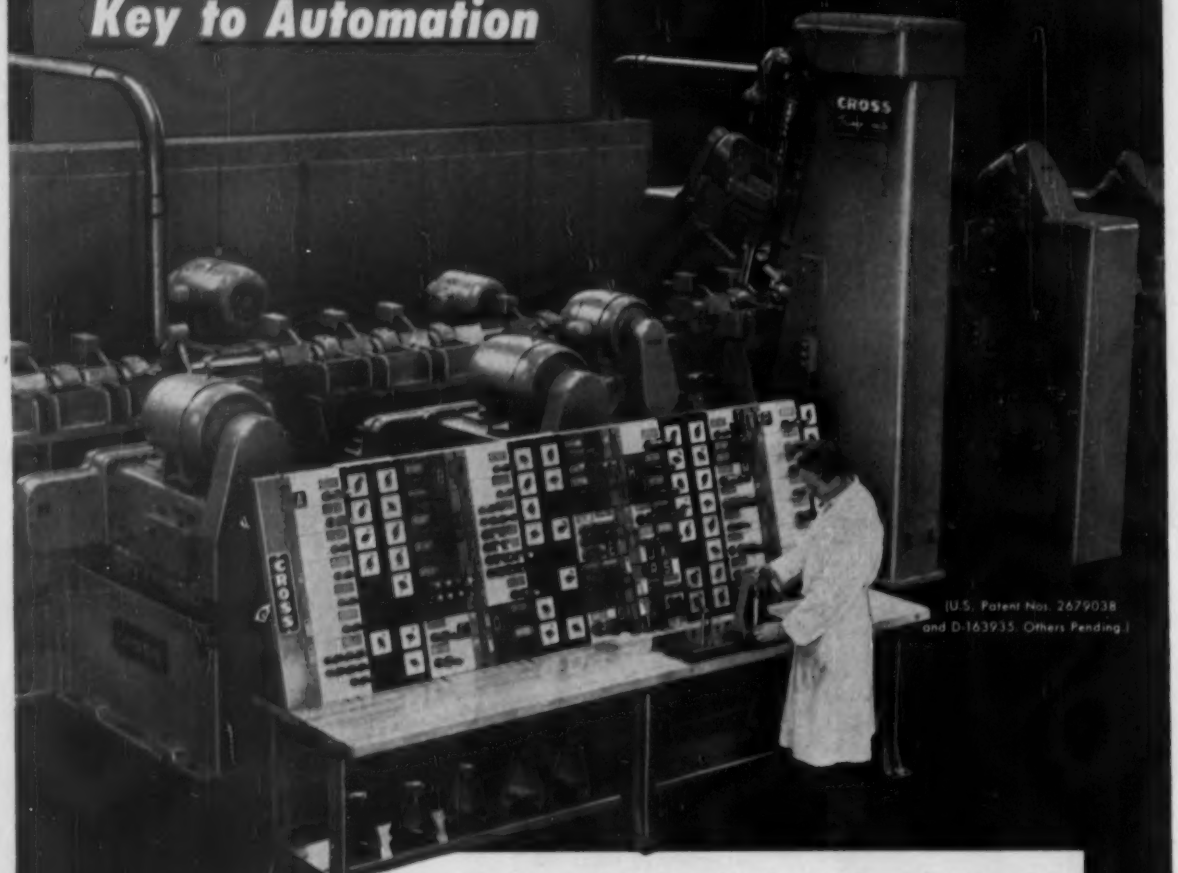
LINDE AIR PRODUCTS COMPANY
A Division of Union Carbide and Carbon Corporation
30 East 42nd Street UCC New York, 17, N. Y.
Offices in Other Principal Cities
In Canada: DOMINION OXYGEN COMPANY
Division of Union Carbide Canada Limited, Toronto

Linde Trade-Mark

"Linde" is a registered trade-mark of Union Carbide and Carbon Corporation.

Cross Machine Control Unit— Key to Automation

A Mechanical Eye to Watch Your Tools



(U.S. Patent Nos. 2679038 and D-163935. Others Pending.)

The greatly increased number of tools used in modern transfer-type machines makes adequate tool control a "must." The Cross Machine Control Unit was developed to meet this need—to cut downtime by programming tool changes . . . to reduce tool expense.

The Cross Machine Control Unit is equipped with Toolometers which furnish a visual record of used and unused tool life and *automatically stop the machine when tools need changing*. Other tools almost used up are replaced at the same time. This grouping of changes, plus the availability of pre-set tools which are stored in the Machine Control Unit, reduces downtime. And downtime for machine adjustments and trial cuts is eliminated because standard fixtures and gages are provided for pre-setting the tools.

Over 500 Cross Machine Control Units now in use are evidence of cost saving benefits. Get full information today.

Established 1898

THE CROSS CO.

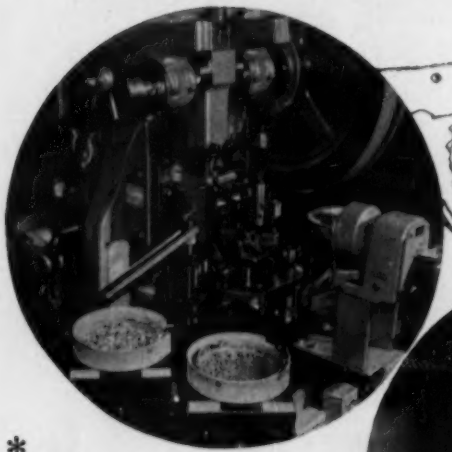
DETROIT 7, MICHIGAN

Special MACHINE TOOLS

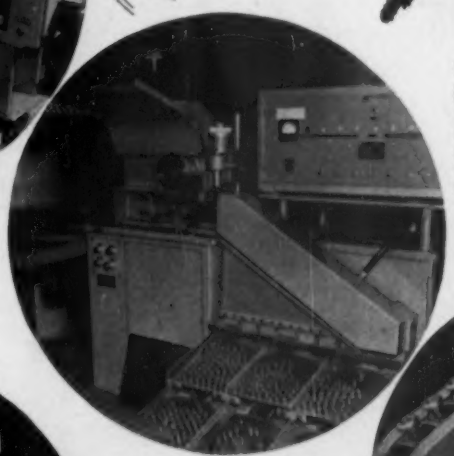
Blueprints call for bearings?

Call on NEW DEPARTURE

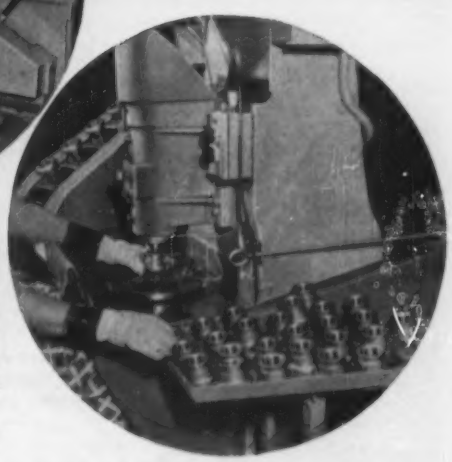
PDQ*!



* **PRICE!**—Savings of automation in New Departure plants are reflected in prices impossible with less modern methods. Here a unique machine automatically assembles refrigerator door bearings . . . with notable savings for the buyer.



* **DELIVERY!**—Electronics work at New Departure! Bearing races are speedily sorted into six dimensional classifications by this machine. Volume is up because New Departure invested in this modern equipment.



* **QUALITY!**—Painstaking quality control, at every manufacturing step, works to approach perfection in every bearing. Here you see an electronic inspection of operational noise level. Any sub-standard part is automatically rejected. There's no chance for error. You are sure of top quality—every time!

PLUS ENGINEERING SERVICE—There's no substitute for experience . . . and New Departure offers you an unmatched backlog of accumulated ball bearing knowledge. So whenever the prints call for ball bearings, check with New Departure for engineering assistance in bearing selection and application. Phone, wire or write . . . you'll get action from New Departure—PDQ!

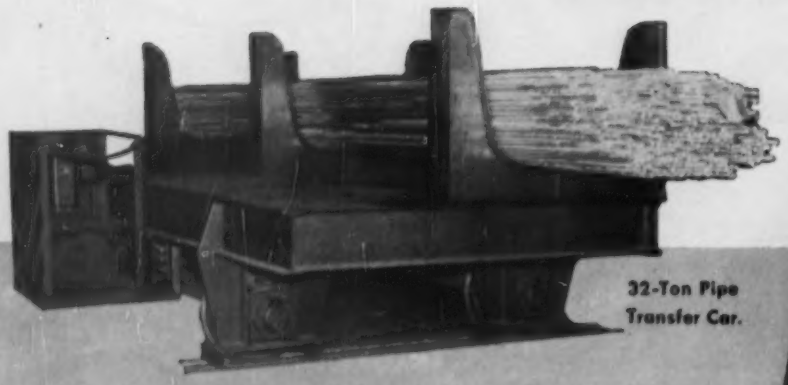
NEW DEPARTURE • DIVISION OF GENERAL MOTORS • BRISTOL, CONNECTICUT

NEW DEPARTURE

BALL BEARINGS

NOTHING ROLLS LIKE A BALL.

SIMPLIFIED *Safety Type* TRANSFERS



32-Ton Pipe Transfer Car.

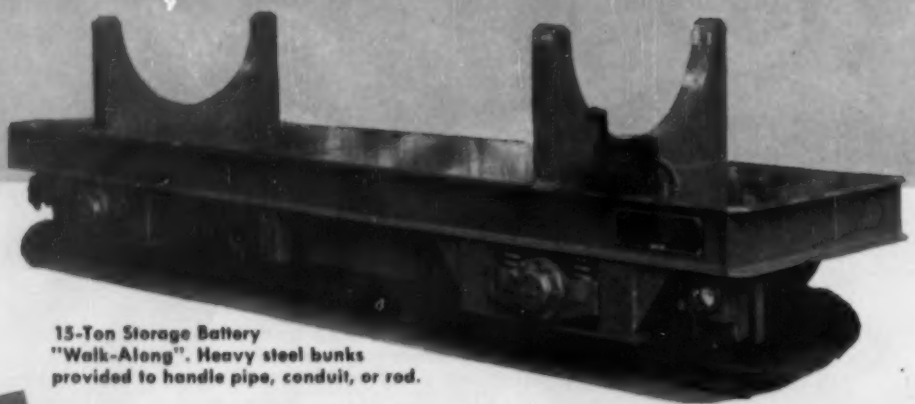
- STORAGE BATTERY Walk-Along or Rider-Type
- GAS-ELECTRIC
- DIESEL-ELECTRIC
- CABLE REEL . . . AC
- CABLE REEL . . . DC
- CABLE REEL . . . AC with fluid coupling

Also remotely controlled cars without trailing cable.

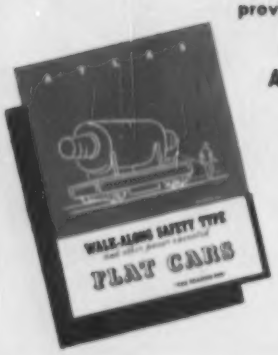
- Atlas Transfers are controlled by one lever. When the lever is released the car stops. This simplicity assures safety so that no assigned operator is necessary.

SAFE because there is only one control lever.

SAFE because the car will move only when the operator holds the lever.



15-Ton Storage Battery "Walk-Along". Heavy steel bunks provided to handle pipe, conduit, or rod.



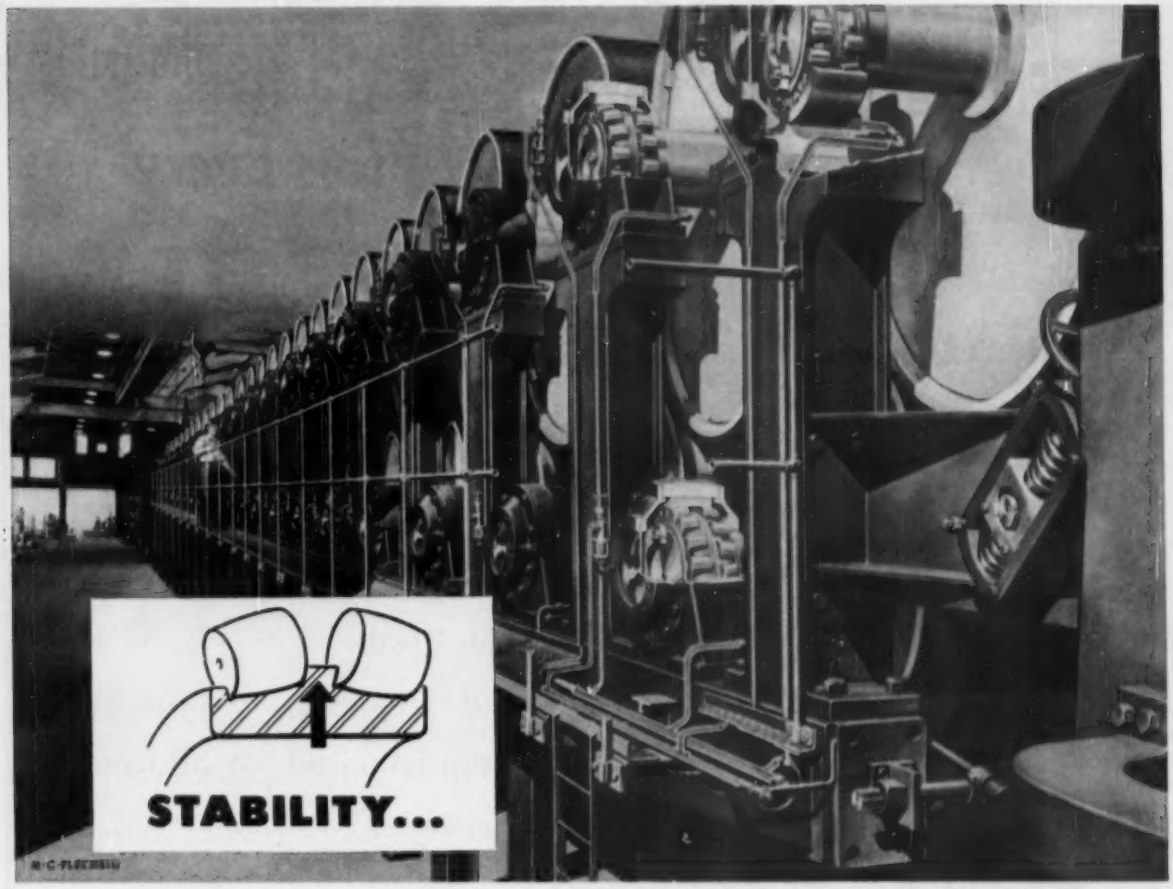
Ask for "Walk-Along" Bulletin 1283 for complete transfer car information.

Manufacturer of Ore Transfer Cars • Scale Cars • Coal Charging Cars • Coke Quenching Cars • Coal and Metal Mining Storage Battery Locomotives.

THE ATLAS CAR & MANUFACTURING CO.

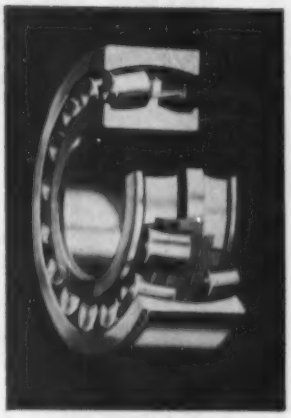
1100 IVANHOE ROAD **CLEVELAND 10, OHIO**

TORRINGTON *Spherical Roller Bearings are used in every kind of heavy duty application requiring high load capacity, resistance to shock and wear under conditions of misalignment.*



TORRINGTON Spherical Roller Bearings

are designed with integral center flange on inner race to provide positive radial stability and positioning for thrust loads



This center flange guides the rollers accurately and friction is reduced to a minimum.

Other performance-building features include accurate geometrical conformity between races and rollers to provide ultimate load carrying capacity; carefully heat-treated races and rollers for maximum resistance to shock and wear; one-piece machined bronze cage for each path of rollers to allow thorough lubrication and give freedom of operation.

These are some of the reasons why TORRINGTON SPHERICAL ROLLER BEARINGS give long, satisfactory performance.

TORRINGTON SPHERICAL ROLLER BEARINGS are available from stock with either straight or tapered bore, for shaft or adapter mounting.

Specify TORRINGTON and get these operational advantages in your equipment.

THE TORRINGTON COMPANY
South Bend 21, Ind. • Torrington, Conn.

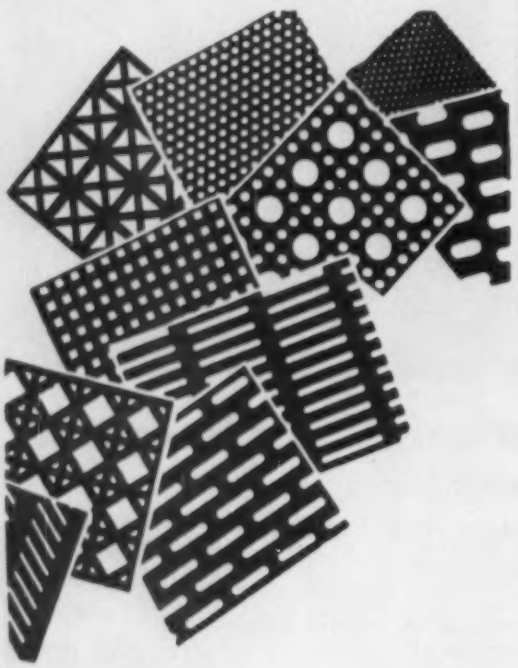
District Offices and Distributors in Principal Cities of United States and Canada

TORRINGTON SPHERICAL ROLLER BEARINGS

Spherical Roller • Tapered Roller • Cylindrical Roller • Needle • Ball • Needle Rollers

PERFORATED METALS for Every Purpose

INDUSTRIAL AND ORNAMENTAL



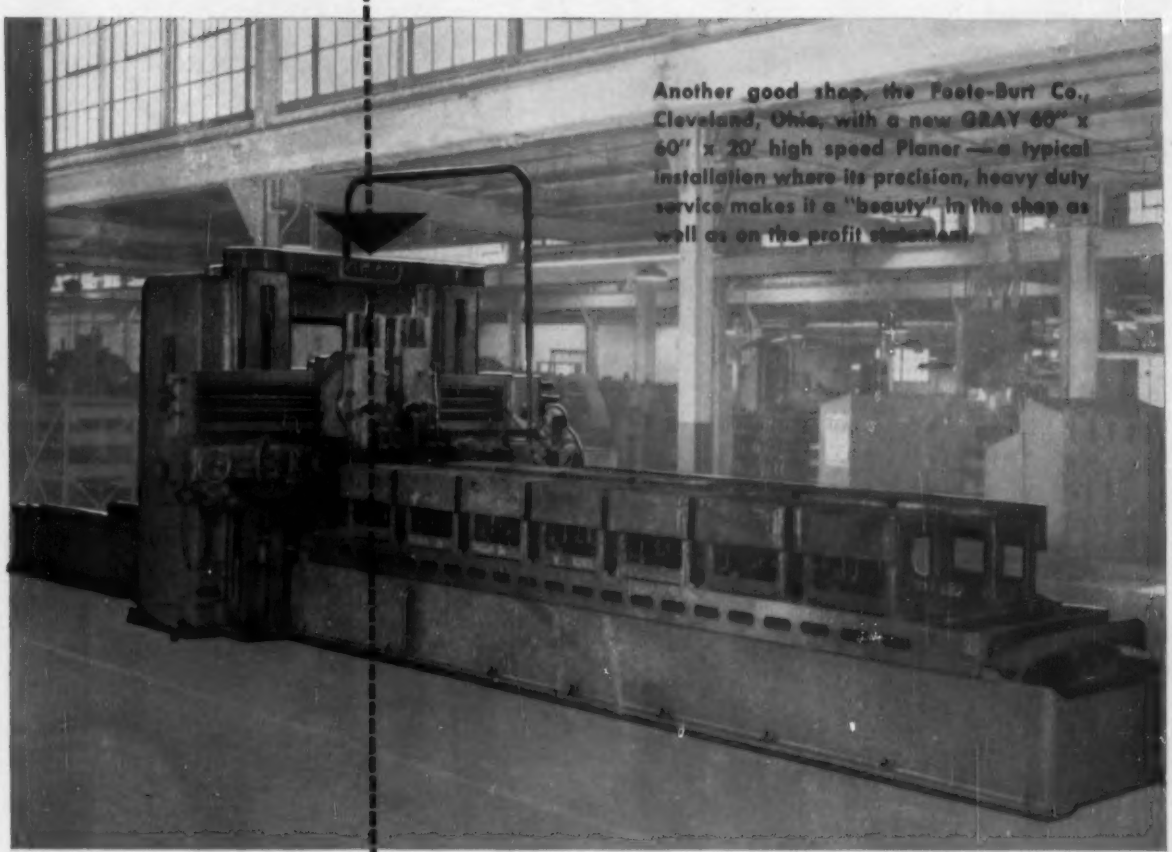
Steel, Brass, Copper, Monel, Bronze, Aluminum, Zinc, Lead, Stainless Steel and all metals or materials punched as required and for all kinds of screens.

We can guarantee perfectly flat sheets free from buckles and camber.

Write for Catalog

CHARLES MUNDT & SONS
59 FAIRMOUNT AVE.
JERSEY CITY, N.J.

the sign of a good shop



Another good shop, the Foote-Burt Co., Cleveland, Ohio, with a new GRAY 60" x 60" x 20' high speed Planer—a typical installation where its precision, heavy duty service makes it a "beauty" in the shop as well as on the profit statement.

a new GRAY planer

. . . recognized by machine shops throughout the world as the ultimate in planers. Built for high production with great precision, combining more original engineering developments and production features than any other planer . . . it is in such demand that GRAY is the largest planer builder.

Write today. Get the story on GRAY

HIGH
low cost
PRODUCTION

The G.A. **GRAY** *Company*

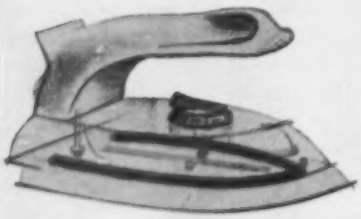
planers • milling planers
planer type milling machines
horizontal boring machines

CINCINNATI 7, OHIO, U. S. A.

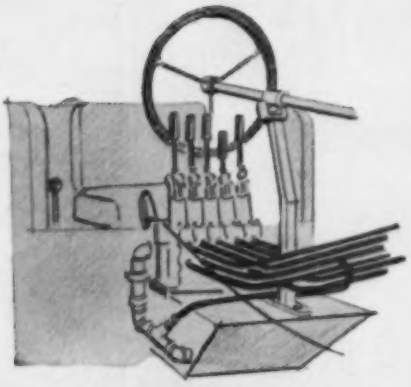
SOLD IN CANADA BY UPTON, BRADEEN AND JAMES, LTD. • SOLD IN LATIN AMERICA BY MACHINE AFFILIATES

BUNDY TUBING COMPANY

FROM *the Bundy Sketchbook*
TO *jog a designer's imagination*



SHEATH FOR HEATING ELEMENT IN HAND IRON



HYDRAULIC CONTROL GROUP IN ROAD GRADER

REMARKS Designing a new product? Or redesigning an old one? Why not avoid delays, expense by turning your tubing headache over to our engineering experts. They offer you a wealth of problem-solving experience, plus the priceless bonus of Bundyweld, the only tubing double-walled from a single strip (see below).

WRITE today for catalog or for help in developing your tubing application.

BUNDY TUBING COMPANY
DETROIT 14, MICHIGAN

FRAME FOR TYPING TABLE

WHY BUNDYWELD IS BETTER TUBING

Bundyweld starts as a single strip of copper-coated steel. Then it's . .

. . . coil-wound . . . rolled twice around laterally into a tube of uniform thickness,

. . . and passed through a furnace. Copper coating fuses with steel. Result . . .

Bundyweld, double-walled and brazed through 360° of wall contact.

BUNDYWELD TUBING®

DOUBLE-WALLED FROM A SINGLE STRIP

Leakproof
High thermal conductivity
High bursting point
High endurance limit
Extra-strong
Shock-resistant
Ductile
Lightweight
Machines easily
Takes plastic coating
Takes plating
Bright and clean
No inside bead
Uniform I.D., O.D.

Bundy Tubing Distributors and Representatives: ***Cambridge 42, Mass.:*** Austin-Hastings Co., Inc., 226 Binney St. • ***Chattanooga 2, Tenn.:*** Poirson-Deakins Co., 823-824 Chattanooga Bank Bldg. • ***Chicago 32, Ill.:*** Lapham-Hickey Co., 3333 W. 47th Place • ***Elizabeth, New Jersey:*** A. B. Murray Co., Inc., Post Office Box 476 • ***Los Angeles 58, Calif.:*** Tubesales, 5400 Alcoa Ave. • ***Philadelphia 3, Penn.:*** Rutan & Co., 1717 Sansom St. • ***San Francisco 10, Calif.:*** Pacific Metals Co., Ltd., 3100 19th St. • ***Seattle 4, Wash.:*** Eagle Metals Co., 4755 First Ave., South ***Toronto 8, Ontario, Canada:*** Alloy Metal Sales, Ltd., 181 Fleet St., E. • **Bundyweld nickel and Monel tubing are sold by distributors of nickel and nickel alloys in principal cities.**

More

CAPACITY
...VERSATILITY
...RIGIDITY
...ACCURACY *

More for your money in the new U. S. VERTICAL MILLING MACHINE!

U. S. Vertical's balanced rigidity is the key to profitable production. Make the same comparison made by hundreds of plants. See why they find the U. S. Vertical to be the low-cost mill they demand. New "U. S." features include hard chrome plated quill, precision honed head and overarm bosses; and a quick change collet draw bar. Write today for complete details.

The U. S. Burke Machine Tool Division,
32 Brotherton Road,
Cincinnati 27, Ohio.

***Accuracy Certified!** Check list showing results of actual inspection tests accompanies each machine.

Compare

FEATURES

- Balanced head and motor
- Simplified belt-speed changing
- Conveniently located reversing switch
- Protected knee gearing
- Lubricated-sealed ball bearings
- Built-in spot light
- Swing-out Tool-Keeper
- Guaranteed close tolerances*
- Hardened and ground lead screws (optional)

Compare

SPECIFICATIONS

	U. S. VERTICAL	
Table Size	9½" x 36"	
Longitudinal Feed	24"	
Cross Feed	9¾"	
Knee Travel	16½"	CHECK THESE AGAINST ALL COMPETITION!
Quill Travel	5½"	
Dovetail Depth	1¼" x 1½"	
Vertical Screw	1⅜" dia.	
Weight	1600 lbs.	
Table Power Feed	0" - 12" per min. (infinitely variable)	

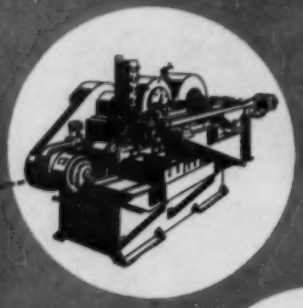
Compare

DELIVERY, too!

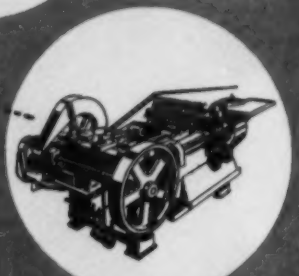
. . . our new plant addition permits us to promise and fulfill prompt deliveries.

THE U·S·Burke MACHINE TOOL DIVISION

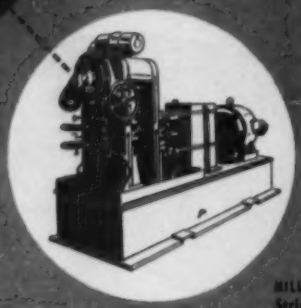
5 KINDS OF WATERBURY FARREL ANSWERS TO YOUR MASS PRODUCTION PROBLEMS



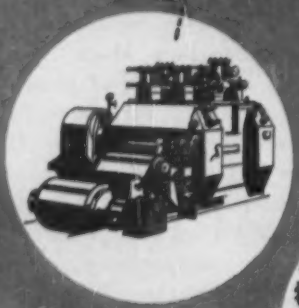
COLD PROCESS BOLT & NUT MACHINERY — Headers (all types) • Rivet Machinery • Trimmers • Thread Rolling Machines • Slotters • Nut Formers and Tappers, etc.



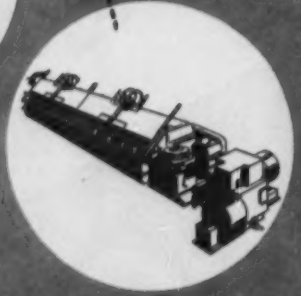
POWER PRESSES — Crank, Cam and Toggle; also Rack and Pinion Presses • Eyelet Machines • Multiple Plunger Presses • Horizontal and Hydraulic Presses, etc.



MILL MACHINERY — Rolling Mills: Strip, Rod, Wire Flattening, (For Ferrous and Non Ferrous Metals) • Also Slitters • Straighteners • Cut-off Saws • Coilers • Winders, etc.



SPECIAL MACHINERY — Sendzimir Mills • Small Arm Ammunition Machines • Collapsible Tube Machines • Coining Mills, etc.



WIRE MILL EQUIPMENT — Continuous Wire Drawing Machines (Upright Cone and Tandem) • Wire Flattening Mills • Chain Draw Benches • Pointers • Swagers • Bull Blocks • Stringup • Machines • Spoolers, etc.

Within These Basic WF Equipment Lines, Individual Machines Are Custom-Engineered For Specific Applications

If your metal-working machinery problem falls into any of these five groups, there are good reasons for looking to Waterbury Farrel for the answer.

There's Waterbury Farrel's continuing engineering research with more than a century of machine building experience to draw upon. This results in soundly designed and thoroughly tested features which improve production.

There's Waterbury Farrel's world-wide reputation for rugged, long-lasting construction. This gives you the assurance that WF machines are built to provide long years of uninterrupted production.

Waterbury Farrel can custom-engineer special equipment or adapt a standard machine to fit your specific problem.

For further information, write for free booklets on any of the machines mentioned on this page or contact your nearest WF office.

HERE'S A SAMPLE of Waterbury-Farrel mass production equipment in action. This complete WF automatic production unit combines a 40-ton double-acting, upright blanking and cupping press, a conveyor feed and four 7-station horizontal drawing presses to draw 340 zinc shells per minute.

FOUNDED WATERBURY FARREL 1851

WATERBURY FARREL FOUNDRY & MACHINE CO. • WATERBURY, CONN.

Offices: Chicago, Cleveland and Millburn, N. J.

PENNSYLVANIA ENGINEERING CORP.

NEW CASTLE, PENNA.

LADLES

WELDED OR RIVETED

5 TO 300 TON CAPACITY

FOR

BLAST FURNACE

OPEN HEARTH

ELECTRIC FURNACE

BESSEMER CONVERTER

FOUNDRY

LADLE TRANSFER CARS

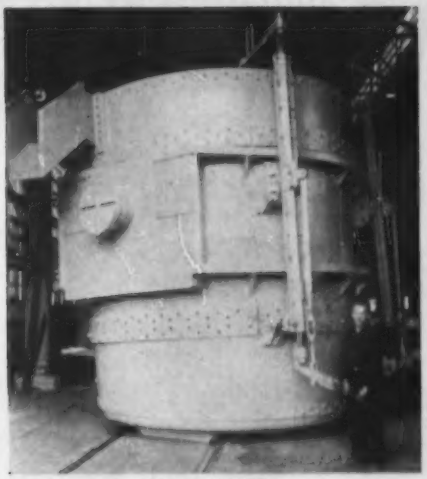
LADLE STANDS

LADLE BAILS

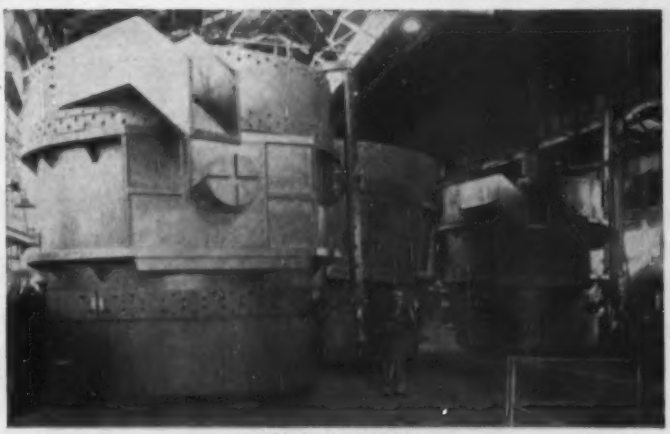
LADLE HOOKS

STRESS RELIEVED

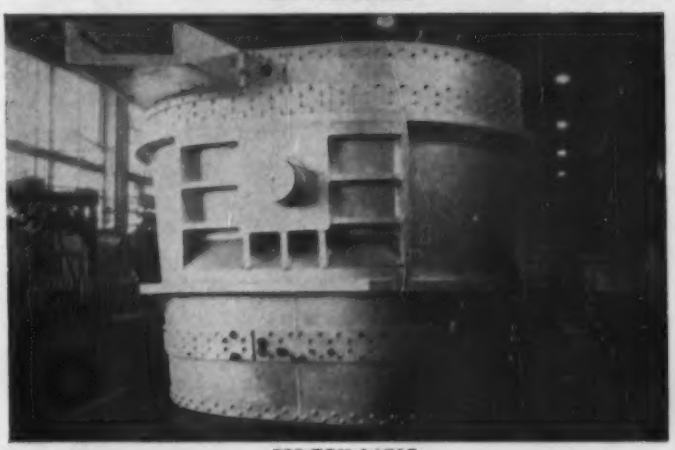
ALL WELDED LADLES



225 TON LADLE



250 TON LADLE

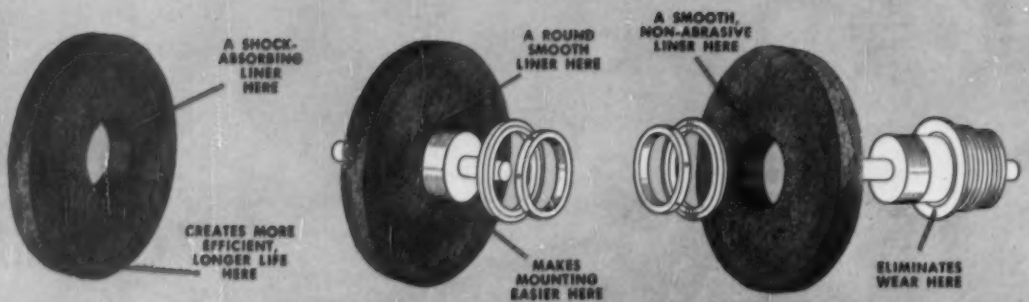


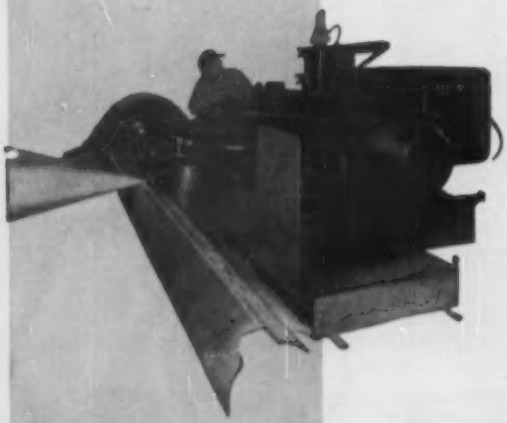
300 TON LADLE

DESIGNERS, FABRICATORS AND ERECTORS OF STEEL MILL EQUIPMENT

For rugged conditioning jobs you can't beat...

MID-WEST FIBER-CUSHIONED SNAGGING WHEELS


A SHOCK-ABSORBING LINER HERE
CREATES MORE EFFICIENT, LONGER LIFE HERE
A ROUND SMOOTH LINER HERE
MAKES MOUNTING EASIER HERE
A SMOOTH, NON-ABRASIVE LINER HERE
ELIMINATES WEAR HERE



Whether you use MID-WEST'S new automatic grinders, or hand-operated swing-frame grinders...

- **Mid-West snagging wheels are easier to mount!**
- **Their greater efficiency cuts grinding costs!**
- **And they're easier on your operator!**

Mid-West designed fiber-cushioned centers, plus Mid-West's special resinoid bond—an extremely tough, tenacious bond—assure increased production and lower grinding costs per ton! For complete information regarding fiber-cushioned snagging wheels—write, wire or phone today.

MID-WEST ABRASIVES

EXECUTIVE OFFICES: 510 SOUTH WASHINGTON ST., OWOSSO, MICH.
FACTORIES: OWOSSO, MICH. • ROCHESTER, PENNA.

when you're buying

BEARINGS

buy all you're entitled to . . .

buy from the manufacturer who has a Complete Line

Single Row Deep Groove

Double Row Deep Groove

Self-Aligning

Angular Contact

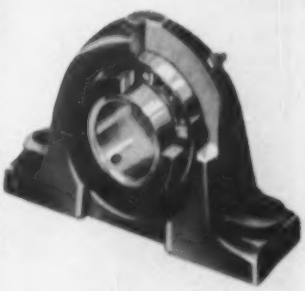
Cylindrical

Improved Spherical Roller

Spherical Roller Thrust

buy from the manufacturer who Keeps Ahead

FIRST with the improved (Type "C") Spherical Roller Bearing, which provides more capacity and longer life than any spherical design available



FIRST with the "SY" Pillow Block, with the most effective seal ever developed for keeping lubricant *in*, dirt *out*.

buy from the manufacturer who gives the most application Engineering Service

The industry's largest home office engineering staff works *with* you and *for* you.

buy from the manufacturer who gives the most Field Engineering Service

For all you're entitled to, specify SKF, because SKF provides it all.

SKF INDUSTRIES, INC., PHILADELPHIA 32, PA.— *manufacturers of* SKF *and* HESS-BRIGHT® *bearings.*

7548

SKF®

BEARINGS AND PILLOW BLOCKS

ALL TYPES...ANY CLASS FIRE!

Since different fire hazards require different types of fire extinguishers, PYRENE—C-O-TWO manufactures all types . . . the finest and most complete line on the market today.

When doing business with PYRENE—C-O-TWO, you receive unbiased advice on what is best for your particular fire hazards, whether class A, B or C. Also, there is a well-rounded sales engineering organization having nation-wide representation to render top quality service wherever you're located.

Don't take unnecessary chances . . . the extensive fire protection experience of PYRENE—C-O-TWO over the years is at your disposal without obligation. Get complete facts now!

PYRENE — C-O-TWO

NEWARK 1 • NEW JERSEY

Sales and Service in the Principal Cities of United States and Canada

COMPLETE FIRE PROTECTION

portable fire extinguishers . . . built-in fire detecting and fire extinguishing systems

CARBON DIOXIDE • DRY CHEMICAL • VAPORIZING LIQUID • SODA-ACID • WATER • CHEMICAL FOAM • AIR FOAM

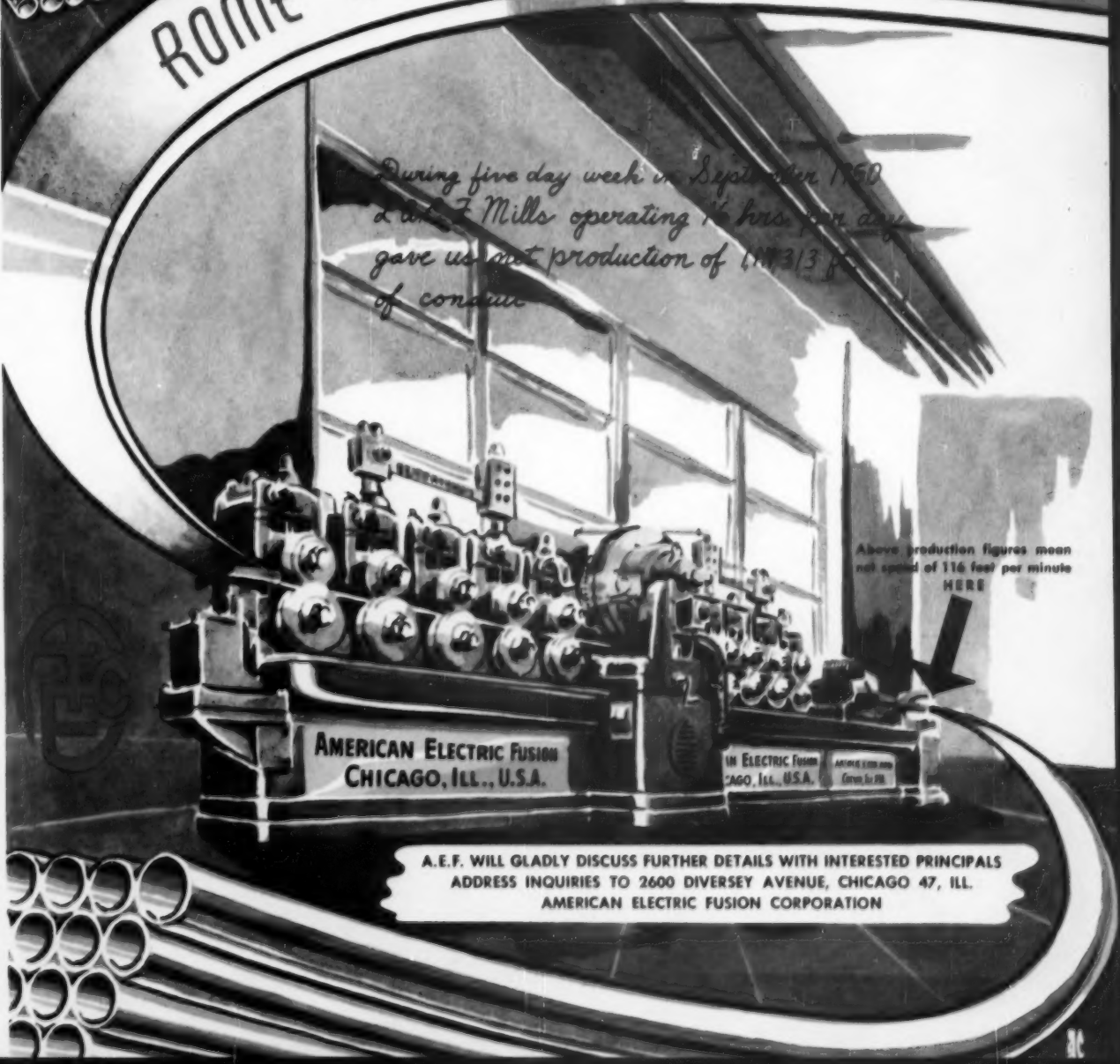
AMERICAN ELECTRIC FUSION CORPORATION

"Roll your own"

HYDRAULIC TESTER FOR CODE PIPING BEFORE SHIPMENT

ROME CABLE CORP. SAYS:

During five day week in September 1960 2 units of Mills operating 16 hrs. per day gave us total production of 111313 ft of conduit



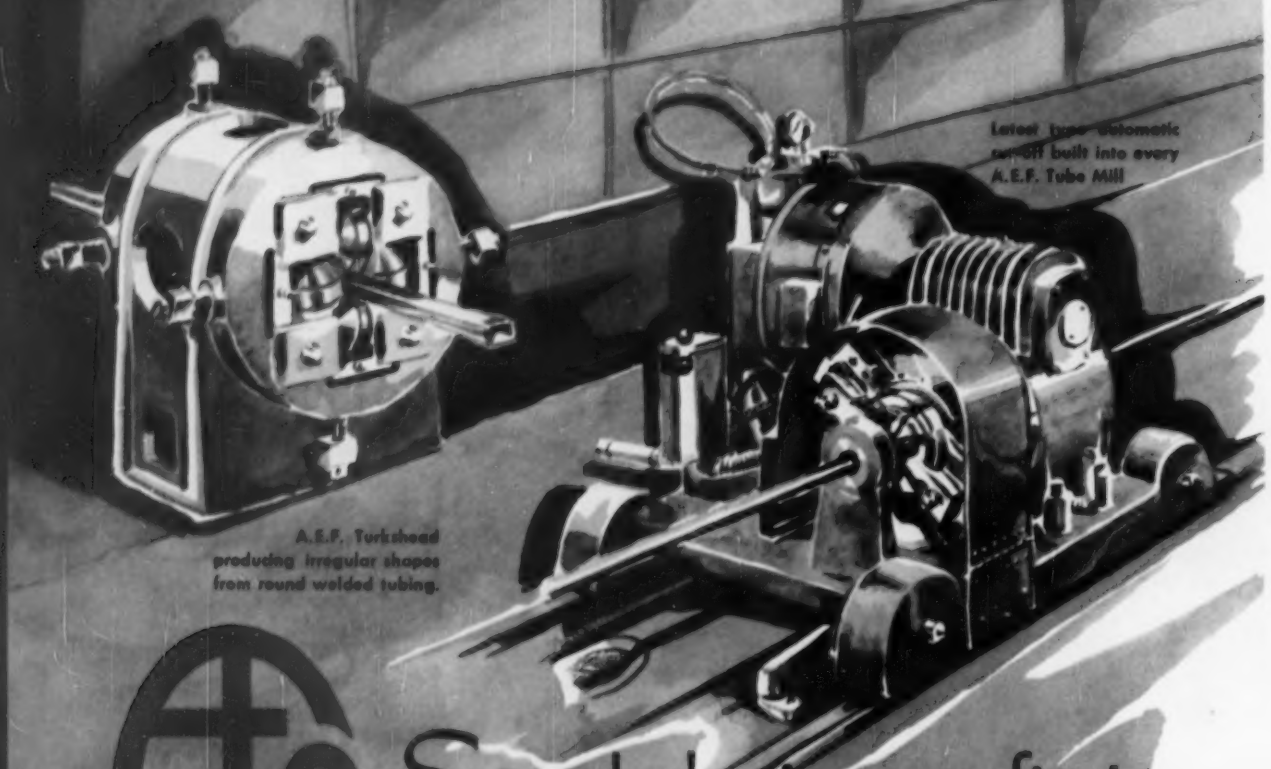
Above production figures mean rate of speed of 116 feet per minute HERE

A.E.F. WILL GLADLY DISCUSS FURTHER DETAILS WITH INTERESTED PRINCIPALS
ADDRESS INQUIRIES TO 2600 DIVERSEY AVENUE, CHICAGO 47, ILL.
AMERICAN ELECTRIC FUSION CORPORATION

AMERICAN ELECTRIC FUSION CORPORATION

2600 DIVERSEY AVENUE

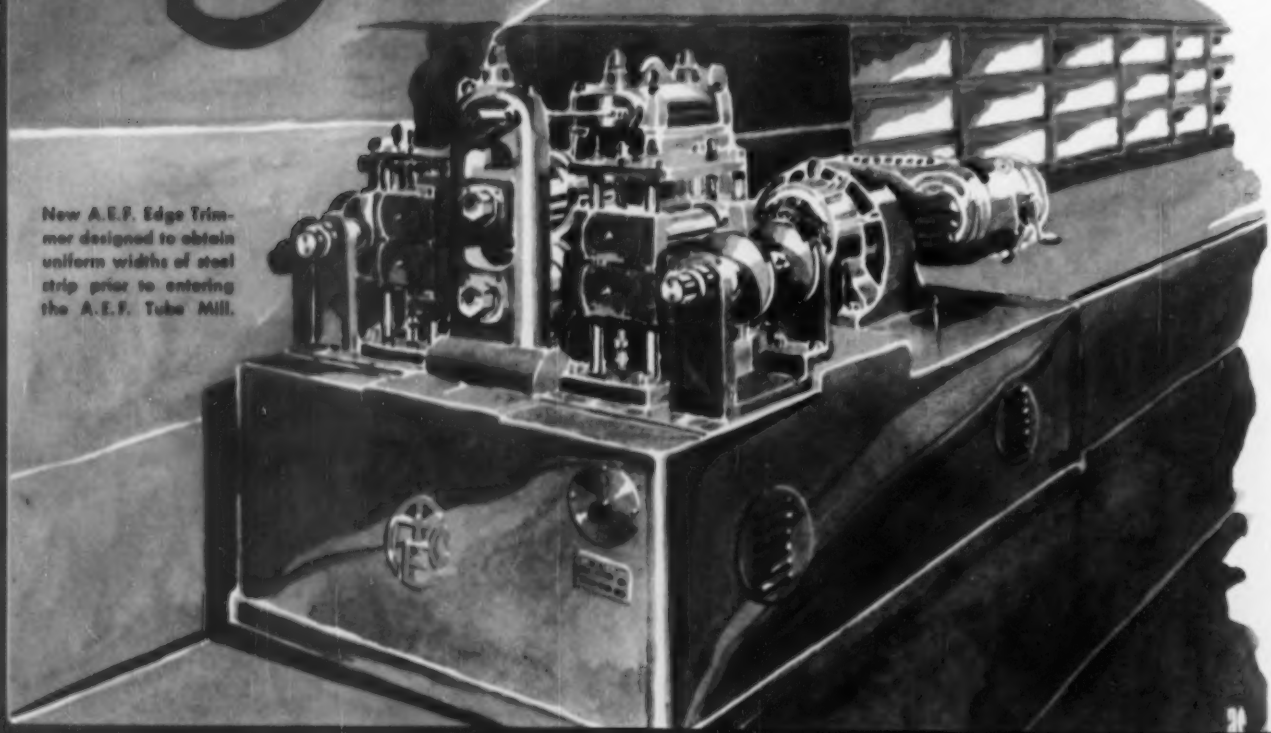
PHONE — BRUNSWICK 8-1640 CHICAGO 47, ILLINOIS



Latest type automatic cut-off built into every A.E.F. Tube Mill

A.E.F. Turkshead producing irregular shapes from round welded tubing.

Sound design — first
Good appearance always



New A.E.F. Edge Trimmer designed to obtain uniform widths of steel strip prior to entering the A.E.F. Tube Mill.

YOU CAN BUILD FOR THE AGES

...with a STEEL FOR THE AGES

What's the building on *your* mind? Maybe a big multi-story structure—or an industrial building, like our own Research Laboratory (see above)? Maybe a plant office building—or a bank, store, school, power station, warehouse, hospital, hotel? Or perhaps it's an existing structure that needs a facelifting—modernizing the exterior, as well as the interior.

In any case, you're sure to consider *curtain wall* construction, because it's the newest, most modern method. Packed with advantages over masonry, too: such as fast, all-weather installation; more space per floor; more floors on a given foundation, etc. And you'll be equally sure to realize that *stainless steel-surfaced panels* (again, see above) promise the best long-term protection for the building investment. No other surfacing material is at once as hard, tough, strong, and lastingly beautiful, as impervious to wear and as resistant to heat and corrosive influences as stainless steel.

That's just why Allegheny Metal generally figures to last longer and cost less in the long run—wherever you use it. Let us help you to realize its benefits. ***Allegheny Ludlum Steel Corporation, Oliver Bldg., Pittsburgh 22, Pa.***

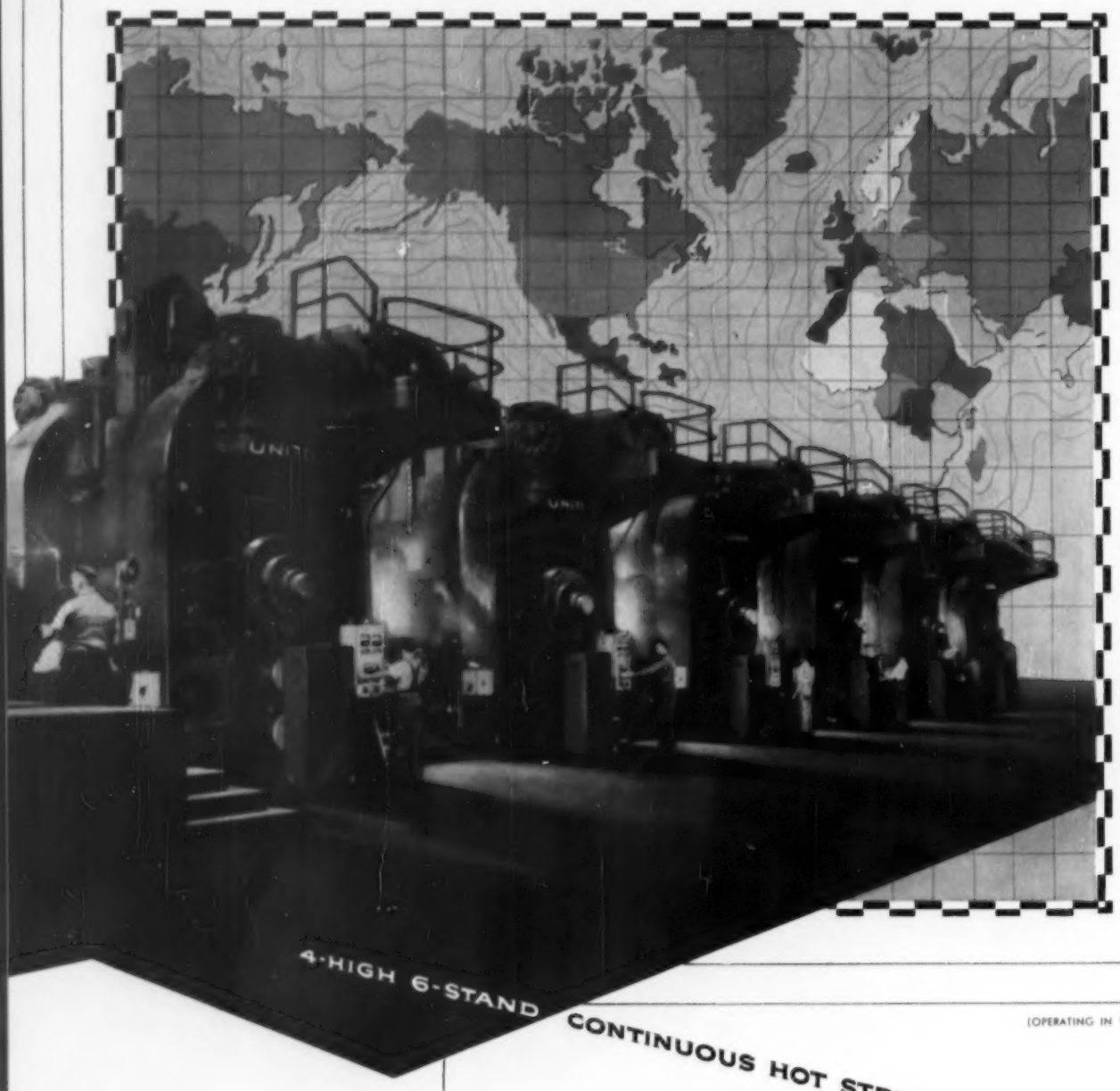
Make it BETTER-and LONGER LASTING-with

Allegheny Metal

AL®
TIME-TESTED STAINLESS STEEL

Warehouse stocks carried by all Ryerson steel plants

W&D 5307 B



4-HIGH 6-STAND CONTINUOUS HOT STRIP MILL

(OPERATING IN WALES)

DESIGNED AND BUILT BY

UNITED

ENGINEERING AND FOUNDRY COMPANY

PITTSBURGH, PENNSYLVANIA

UNITED can serve you no matter where in the world you are.

Plants on PITTSBURGH • VANDERGRIFT • NEW CASTLE • YOUNGSTOWN • CANTON
WILMINGTON (Lobdell United Division)

Subsidiaries: ADAMSON UNITED COMPANY, AKRON, OHIO
STEDMAN FOUNDRY AND MACHINE CO., INC., AURORA, IND.

Designers and Builders of Ferrous and Nonferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other Heavy Machinery. Manufacturers of Iron, Nodular Iron and Steel Castings, and Weldments.

PRODUCTS MANUFACTURED BY

UNITED

ENGINEERING AND FOUNDRY COMPANY

ROLLING MILLS

Blooming • Slabbing • Plate • Universal 2, 3, 4-high • 4-high Hot Strip • Continuous Billet • Bar • Rail and Structural • Merchant Rod • Continuous Rod • Sheet • Skelp • 2 and 4-high Cold Strip • Tin • Uni-Temper.

In all types: Single Stand, One Way or Reversing, Tandem, Continuous, etc. for Carbon Steel, Alloy Steels, Copper, Brass, Aluminum, Magnesium, Titanium and other Nonferrous Metals.

ROLLS

United Special (Green Wabblers) Chill and Grain • United Regular Chill • United Nickel Chill • United Moly Chill • United Special Process • United UX Chill and Grain • United M. C. • United T. G. • United MX • United F. C. • United H. M. • United Hyton • United Rail Finishing • United Special Alloy Steel • United Carbon Steel • United Adamite • United DU • United Van X • United Back-Up (Special, Super X, Apex) • United Floor Plate.

AUXILIARY EQUIPMENT

Ingot Cars
Manipulators
Edgers
Mill Tables
Transfers
Hot Beds
Structural Straighteners
Bloom Shears
Vertical Shears
Hot and Cold Saws
Rod Reels
Hot Strip Reels
Flying Shears
Shearing Lines
Flying Strip Sample Punches
Billet Bundle Busters
Slitting and Trimming Lines
Draw Benches
Steam Hydraulic Forging Presses
Electro-Hydraulic Forging Presses
Piercing Presses
Hydraulic Presses
Universal Couplings
Welding Manipulators
Plate and Squaring Shears
Precision Levellers
Cone Type Uncoilers
Coil Boxes
Upcoilers and Downcoilers (Strip)
Cold Strip Reels
Cone Worm Drives
Gear Reduction Units
Generated Gears and Pinions
Cast Tooth Steel Mill Pinions
Processing Scale Breakers
Continuous Strip Picklers
Semi-Continuous Strip Picklers
Continuous Annealing Lines
Electrolytic Strip Cleaning Lines
Electrolytic Strip Tinning and Coating Lines
United Mill Lubricating Systems
Material Handling Equipment
Portable Crop Shears
Lever Shears
Roll Lathes and Rollafeeds
Pressuremeters
Heavy Weldments
Annealing Boxes
Steel Castings

★ ★ ★

MACHINERY FOR THE RUBBER, PLASTICS, AND PLYWOOD INDUSTRIES

Mills
Crackers
Washers
Large Molds
Pot Heaters
Vulcanizers
Autoclaves
Hydraulic Presses
Multi-Platen Presses
Automatic Curing Presses
Belt Curing Presses
Compression Molding Presses
Plywood Presses
Auxiliary Equipment
Refiners
Mixers
Calenders
Rolls — Chill and Alloy Iron
Rolls — Alloy Steel

★ ★ ★

MACHINERY FOR THE PAPER INDUSTRY AND MACHINE TOOLS

Double Wheel, Single Bed Roll Grinders for paper mill use
Machine Calender Stacks
Vertical Facing and Boring Grinders
Heavy Duty, Single Wheel, Double Bed Roll Grinders for rolling mill and similar applications
Lobdell Micrometer Roll Calipers — saddle type
Nazel Electro Pneumatic Forging Hammers — self contained
Lobdell Dill Traveling Head Slotters
Fabricated Rolls for paper textile converting applications
Custom built machinery
Bridgeport Abrasive Cut-Off Machines
Bridgeport Grinders

★ ★ ★

MACHINERY FOR CRUSHING, GRINDING, PULVERIZING, MIXING AND SCREENING

Acidulating Pans
Acid Weigh Scales
Batch Mixers
Crushers
Disintegrators (Cage Mills)
Dust Weigh Hoppers
Fertilizer Machinery
Glass Cullet Crushers
Hashers
Hammer Mills
Mixing Pans
NIFE-Less Hogs
Pan Mixers (Wet Mixing)
Rolling Ring Crushers
Screening Units
Swing Hammer Grinders
Tailings Disintegrators
Vibrating Screens

Complete self-contained units for grinding, mixing, screening and bagging.

UNITED ENGINEERING AND FOUNDRY COMPANY
PITTSBURGH, PENNSYLVANIA

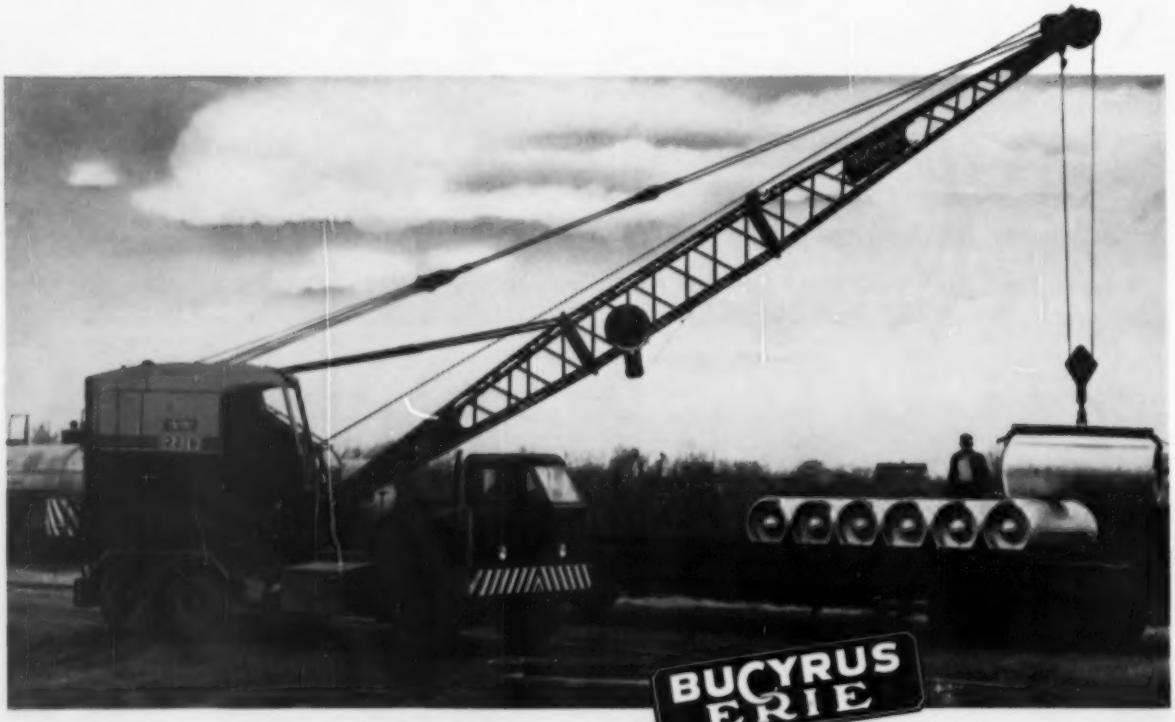
They Have What It Takes To Lower Your Material Handling Costs

BUCYRUS-ERIE CRANES

You can save time and money with a Bucyrus-Erie lifting crane on your jobs because every Bucyrus-Erie is designed as an individual model to meet the job requirements of its particular range.

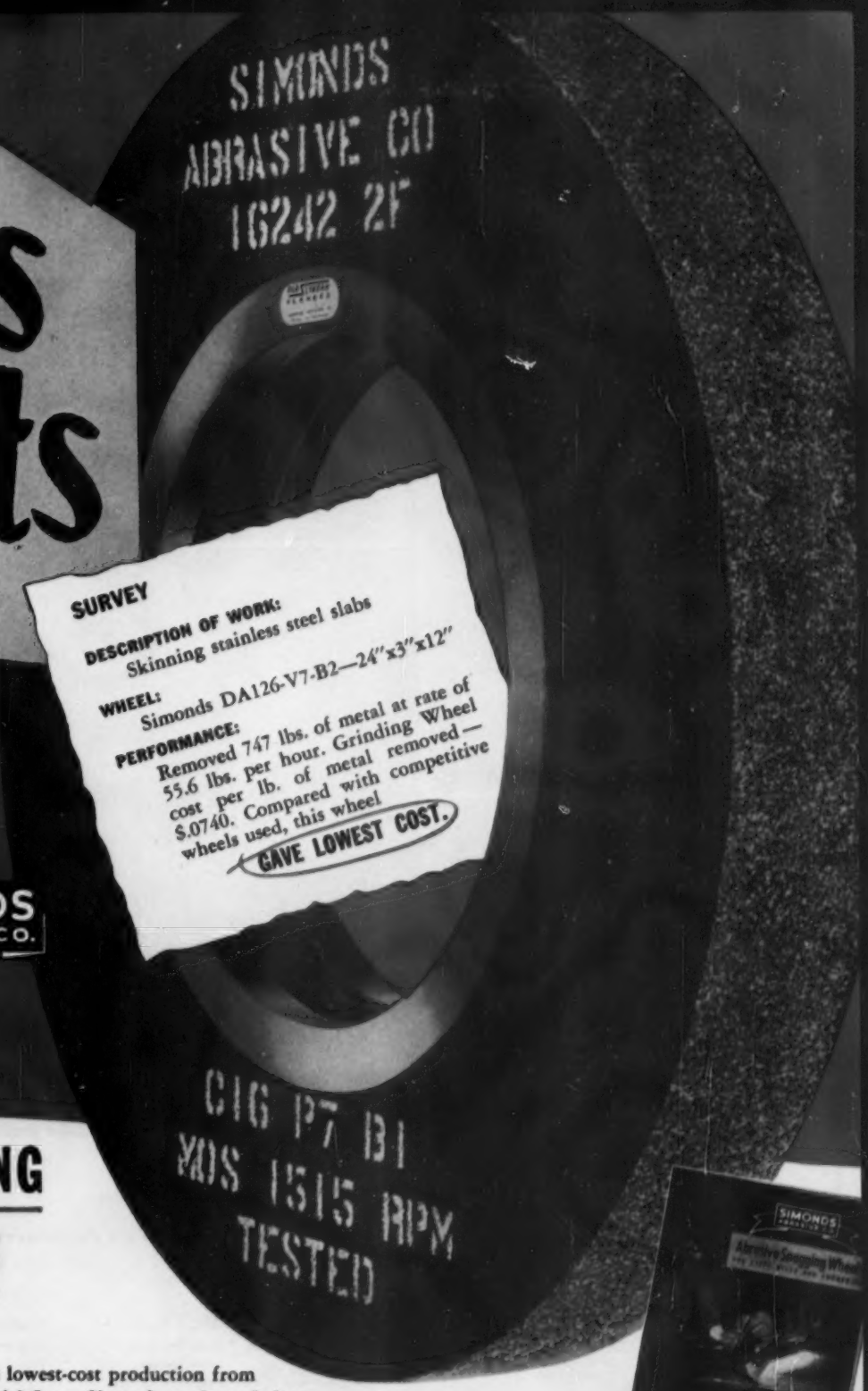
Speed, power, strength and weight are all perfectly matched to rated lifting capacity. Operating machinery is concentrated behind the center of rotation, providing proper balance and ample strength. There is no excessive counterweight to swing, more power is available for the job. The flow of power from engine is guarded at every point against excessive friction loss.

If your operations call for high speed mobility, look into Bucyrus-Erie Transit Cranes (carrier mounted) with 15- and 25-ton capacity. There are also eight Bucyrus-Erie crawler cranes to meet any requirements — capacities range from 3- to 60-tons (nominal ratings). See your Bucyrus-Erie distributor for complete details on the machine that fits your needs. 52E54



SOUTH MILWAUKEE, WISCONSIN

Cuts costs



SURVEY

DESCRIPTION OF WORK:
Skinning stainless steel slabs

WHEEL:
Simonds DA126-V7-B2—24"x3"x12"

PERFORMANCE:
Removed 747 lbs. of metal at rate of 55.6 lbs. per hour. Grinding Wheel cost per lb. of metal removed—$.0740. Compared with competitive wheels used, this wheel

GAVE LOWEST COST.

SIMONDS
ABRASIVE CO.

SNAGGING WHEELS

Are *you* getting the lowest-cost production from your grinding wheels? Let a Simonds engineer help you find out. Whether you use floorstand, swing frame or portable grinders, he can recommend the Simonds Wheels to give you fast, economical production.

Send for catalog bulletin "Abrasive Snagging Wheels" form ESA-62

SIMONDS ABRASIVE COMPANY • PHILADELPHIA 37, PA.

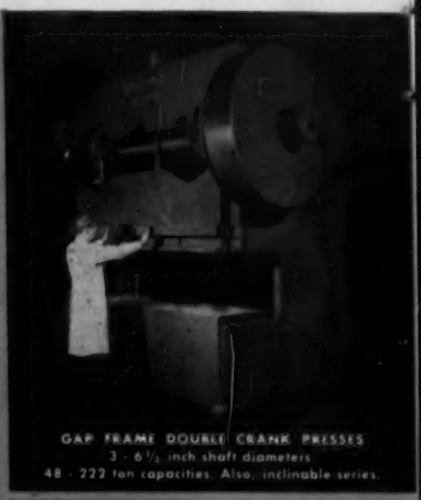
Branch Warehouses Boston, Detroit, Chicago, Portland, San Francisco • Distributors in Principal Cities
Division of Simonds Saw and Steel Co., Fitchburg, Mass. • Other Simonds Companies: Simonds Steel Mills, Lockport, N.Y.,
Simonds Canada Saw Co., Ltd., Montreal, Quebec and Simonds Canada Abrasive Co., Ltd., Arvida, Quebec

In plate or sheet metalworking...

NIAGARA MACHINES CAN

PRESS BRAKES
50 - 775 ton capacities.

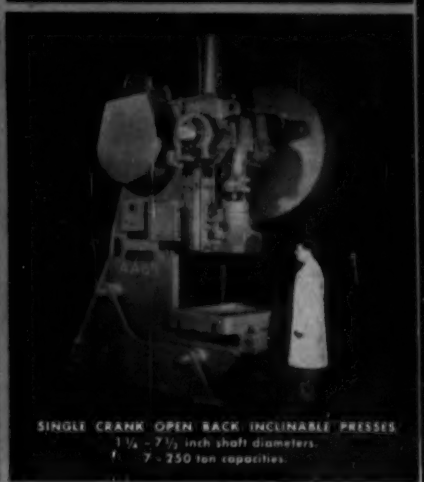
COMBINATION CIRCLE SHEARS AND FLANGES
High speed machines handling a wide range of medium to heavy work



GAP FRAME DOUBLE CRANK PRESSES
3 - 6½ inch shaft diameters.
48 - 222 ton capacities. Also, inclinable series.

BENDING ROLLS
Hand and power driven for a wide range of lengths and thicknesses.

STRAIGHT SIDE DOUBLE CRANK PRESSES
50 - 300 ton capacities.



SINGLE CRANK OPEN BACK INCLINABLE PRESSES
1¼ - 7½ inch shaft diameters.
7 - 250 ton capacities.

NIAGARA

America's most complete line of presses, shears, machines and

DRUM MAKING EQUIPMENT

ELECTRONIC AUTOMATIC WELDER

FOLDER — BRAKES
- Adjustable Bar Folders
- Universal Folders and Brakes

GROOVERS and SEAMERS

HAND or FOOT OPERATED SHEARS
- Circle Shears
- Foot Curved Shears
- Foot Gap Shears
- Foot Squaring Shears
- Ring Shears
- Rotary Slitting Shears

HAND TOOLS
- Bench Plates
- Bench Shears
- Hammers
- Hand Groovers
- Hollow Punches
- Rivet Sets
- Snips
- Stakes

LEVER SHEARS and PUNCHES
- Bar and Rod Cutters
- Combination Lever Punches and Shears
- Lever Punches
- Lever Shears
- Notchers

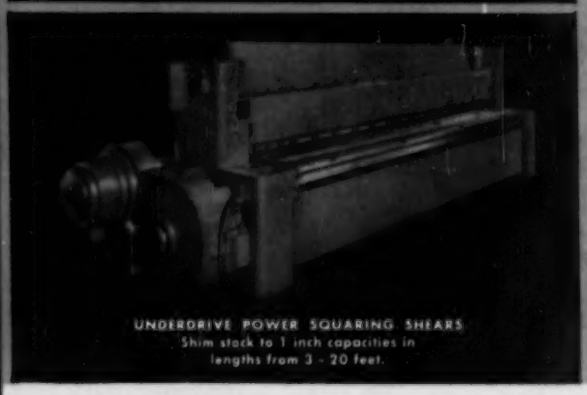
POWER PRESSES
- Bench Presses
- Foot Presses
- Gap Frame Double Crank Presses
- Gap Frame Single Crank Presses
- Horn Presses — Side Seamers
- Hydraulic Presses
- Inclinable Gap Frame Double Crank Presses
- Inclinable Presses
- Straight Side Double Crank Presses
- Straight Side Eccentric Geared Presses
- Straight Side Single Crank Presses

POWER PRESS BRAKES

POWER SQUARING SHEARS
- Economy Line Power Squaring Shears (14 Gage Max.)
- Gap Frame Overdrive Power Squaring Shears
- Light Gage High Speed Power Squaring Shears
- Underdrive Precision Type Heavy Duty Power Shears

DO THE MOST* FOR YOU

STRAIGHT SIDE ECCENTRIC GEARED PRESSES
One, two and four-point suspension.
100 - 1000 ton capacities.



UNDERDRIVE POWER SQUARING SHEARS
Shim stock to 1 inch capacities in
lengths from 3 - 20 feet.

*** MOST EXTENSIVE LINE:**

From giant, power-operated machinery to small hand tools

*** MOST ADVANCED DESIGNS:**

Years ahead in performance through forward-thinking engineering

In the world's largest automotive and appliance plants or the smallest of sheet metal shops, Niagara machines and tools are usually at work "in force."

Batteries of giant presses are teamed up with speedy ring and circle shears. Massive, rugged press brakes stand side-by-side with powerful bending rolls and squaring shears. Versatile lever punches, rotary machines, groovers and seamers . . . all operate together to produce a better product at lower cost. The Niagara lines are "companion lines" of metalworking machines and tools that work together. A Niagara-equipped shop or plant is years ahead in quality and volume of production.

Whatever you require — power presses or hand tools — Niagara is the line that can do the most for you. It is the most complete in the industry . . . the most advanced in engineering. You can consult a Niagara representative with complete confidence of unbiased recommendations. Niagara has the right machines and tools for your requirements.

tools for plate and sheet metal work

NIAGARA 75 YEARS

POWER ROTARY SHEARS
- Power Circle Shears
- Power Circle Shears and Flangers
- Power Ring and Circle Shears

ROTARY MACHINES
- Bending
- Burring
- Combination Machines
- Corrugating
- Crimping
- Edging
- Flanging
- Forming and Curving Machines
- Multi-Drive Table for Rotary Machines
- Setting Down Machines
- Turning
- Wiring

SLIP ROLL FORMERS
- Hand and Power Machines

BRING YOUR FILES UP-TO-DATE WITH INFORMATIVE NIAGARA BULLETINS

Listed at the left are the diversified machines and tools that make up the famous Niagara line. Be sure that you have the latest data on the ones that apply to your type of work. At your request, specific Niagara Bulletins will be mailed promptly, without obligating you.

NIAGARA MACHINE & TOOL WORKS • BUFFALO 11, N. Y.

DISTRICT OFFICES:
Buffalo • Cleveland • Detroit • New York • Philadelphia
Dealers in principal U. S. cities and major foreign countries

You can have the best die blocks and forgings— CALL ANY OF THESE FINKL DISTRICT OFFICES

Seventy-five years of experience is behind the quality and performance of Finkl products. Take advantage of that knowledge. Call the Finkl representative nearest you the next time you are planning your die blocks or forgings.

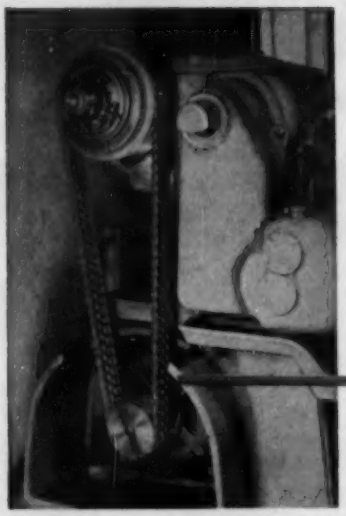
- **DETROIT 26,** *MICH., 2838 Book Building • WOodward 1-1315*
- **CLEVELAND 14,** *OHIO, 1914 NBC Building • CHerry 1-2939*
- **PITTSBURGH 22,** *PA., 762 Gateway Center • ATlantic 1-6391*
- **INDIANAPOLIS 5,** *IND., 132 East 30th Street • HICkory 4647*
- **HOUSTON 1,** *TEXAS, P. O. Box 1891 • CApitol 2121*
- **ALLENTOWN,** *PA., 737 North 22nd Street • HEmlock 4-3333*
- **ST. PAUL 1,** *MINN., 445 Endicott Building • CApitol 2-1600*
- **COLORADO SPRINGS,** *COL., 534 West Cheyenne Road • MElrose 2-0431*
- **SAN FRANCISCO 5,** *CAL., Monadnock Building • EXbrook 2-7017*
- **SEATTLE 4,** *WASH., 3104 Smith Tower • SENeca 5393*
- **BIRMINGHAM 9,** *ALA., P.O. Box 5834 • 29-5731*
- **KANSAS CITY 6,** *MO., 950 Diercks Building • HARrison 1060*
- ★**Eastern Warehouse: EAST CAMBRIDGE 41,** *MASS., 250 Bent St. • ELliot 4-7650*
- ★**Western Warehouse: LOS ANGELES 29,** *CAL., 10735 Sessler St. • LOrain 6-2143*

1879 F 1954 75th ANNIVERSARY

A. Finkl & Sons Co.

2011 Southport Ave., Chicago 14, Telephone DIversey 8-2600

FORGINGS • DIE BLOCKS • ELECTRIC FURNACE STEELS



Performance Proves

20% to 90%

LESS VIBRATION

with Veelos—the Balanced V-belt

Engineers have long known that there are four principal causes of machine vibration: 1. bearings; 2. motor; 3. clutch; 4. sheaves. Often overlooked is a fifth cause: v-belts. And, in many instances, *v-belts alone* are the major cause of vibration.

There's a logical reason for this.

Regular v-belts have spots of varying density due to their construction. Normally, these spots are not apparent, yet they throw the belt out of balance when the drive is operating. As a result, vibration is created that can damage bearings, shafts and, most important, the finished work.

This is not true of Veelos v-belts.

Veelos is absolutely uniform throughout its entire length. Every link and every stud is identical. The smooth, machine-cut sides and the laminated construction assure smooth, vibrationless power delivery. Veelos is perfectly balanced.

In case after case, installation of Veelos v-belts has reduced machine vibration 20% to 90%.

Proof that Veelos will reduce vibration can easily be demonstrated with an electronic vibration analyser. This analyser measures amplitude of vibration to as low as 2-millionths of an inch.

Fifteen minutes of your time is all that is required to show you with the electronic analyser that Veelos creates less machine vibration. Drop us a line or clip the coupon for a demonstration.

VEELOS
THE LINK
V-BELT

Veelos is known as Veelink outside the United States.

Manheim Manufacturing & Belting Company
653 Manbel St., Manheim, Pa.

Yes, I would like a demonstration. **Have your representative call me for a convenient time.**

Name.....

Company.....

Address.....

.....

ADJUSTABLE TO ANY LENGTH • ADAPTABLE TO ANY DRIVE

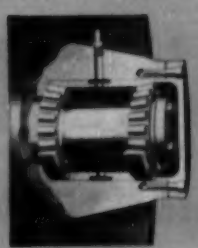
only FEDERAL has

so many big features!

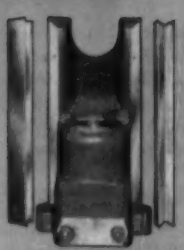
• Patented Brake Design. Spring tension permits expansion — available with automatic release, if desired.

• Solid Web-Type Flywheels. An important safety factor.

• Non-Repeat Clutch. An exclusive Federal feature.



• Timken Bearing Flywheels. Eliminate wear on crankshaft, readily adjusted.



• Longer "V" Ways, Gibs. Added speed, accuracy. Hand-scraped to perfect alignment.

plus **Oversized Crankshafts • Generous Shut Height • Front-Operated Recline**

No. 7 Flywheel type
Capacity, 80 tons

Here are important features, typical of the extra quality built into every FEDERAL Press. And they add up to give FEDERAL users a definite edge, production-wise and cost-wise. For these rugged, precision-built presses boost output, eliminate accidents, maintain high production schedules. Offered in four major classes—Standard, Dial Feed, High Speed and Special presses from 6 to 80 tons. Call your Federal representative. *Write for new catalog.*

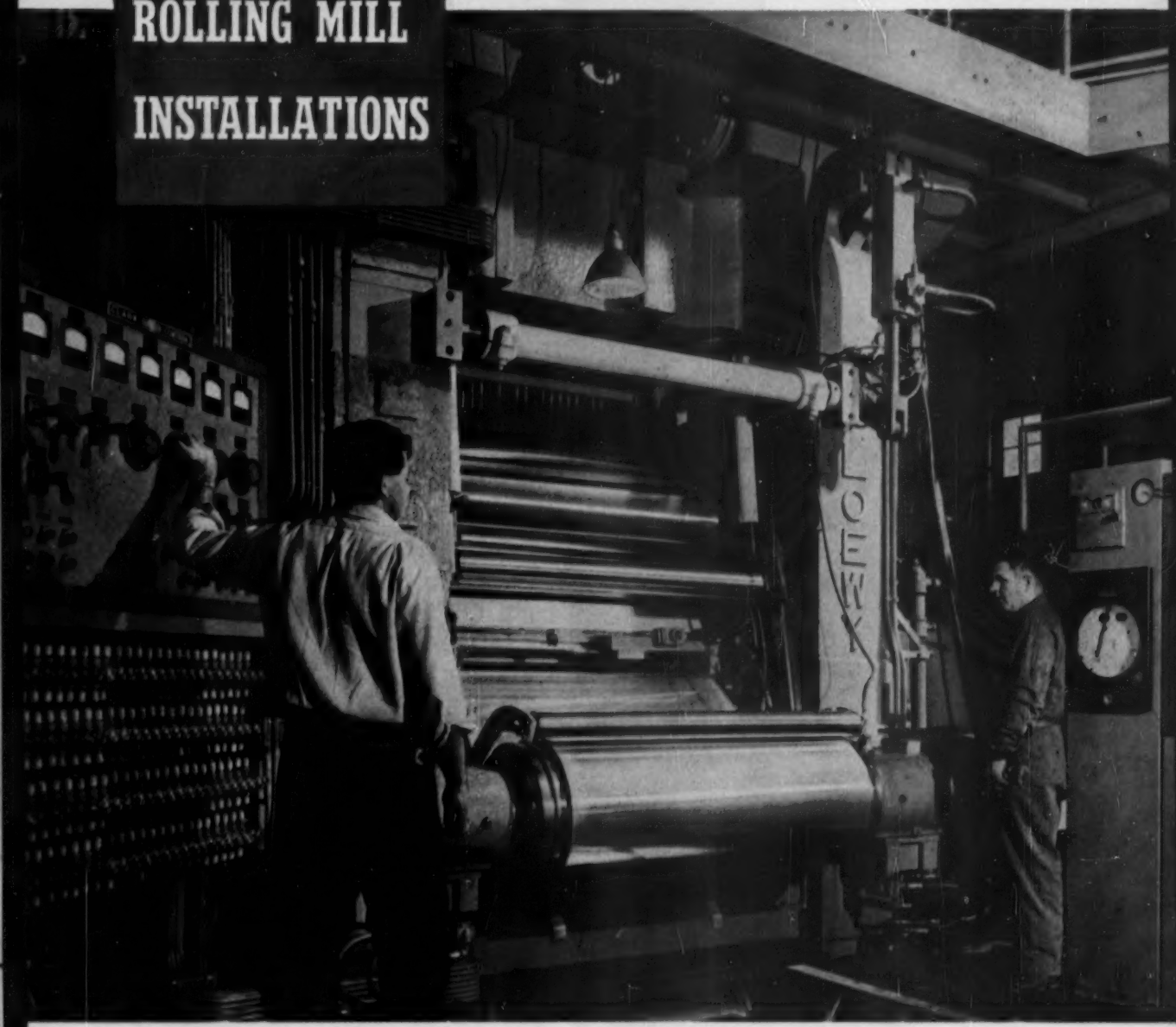
THE FEDERAL PRESS COMPANY
502 Division Street, Elkhart, Indiana

FEDERAL *Come back Indicable* PRESSES

30 Years of Quality Construction

WE BUILD COMPLETE ROLLING MILL INSTALLATIONS

THREE-HIGH OR TWO-HIGH BLOOMING MILLS • SKELP ROLLING MILLS
CONTINUOUS BILLET AND SHEET BAR MILLS • CONTINUOUS STRIP MILLS
HIGH SPEED COLD ROLLING SHEET AND STRIP MILLS • SPECIAL MILLS
CONTINUOUS MERCHANT AND WIRE-ROD MILLS • MERCHANT MILLS
RAIL AND STRUCTURAL MILLS • HIGH SPEED FOIL MILLS



"Aluminum . . . Foil up to 54 inches wide—the widest made in the West and equal to the widest produced in the Nation—is produced by the plant's new Four-High 60-inch Mill . . . increases the plant's rated annual capacity from 12 million pounds per year to 18 million, a boost of 50 per cent, and permits the Corporation to keep pace with the mushrooming demand for wide foil . . . Can reduce aluminum in thickness from .026 of an inch to .00025 of an inch and operates at speeds up to 3,000 feet per minute . . ."

KAISER ALUMINUM & CHEMICAL CORP.

DESIGNED AND BUILT BY

LOEWY HYDROPRESS INC

ROLLING MILL DIVISION

ENGINEERS • CONTRACTORS

350-B Fifth Avenue, NEW YORK 1, N. Y.

Rolling Mills • Hydraulic Presses • Pipe Testing Machines • Special Pipe Mill Equipment • Accumulators • Pumps • Die Casting Machines

where only the right steels work

J&L sheet and strip

serving steel users everywhere

linked by water to the Middle West and South

J&L's nation-wide distribution is supported by its location and facilities for prompt, dependable river, rail, and truck shipments.

Your particular requirements for formability, uniformity, and drawing qualities determine every step in the production of your order of J&L Sheet and Strip.

An understanding of product end use, and the physical and chemical properties required to do the job, are the foundation for J&L quality control practices. And J&L quality control assures accurate adherence to your specifications.

You can depend on J&L for Sheet and Strip Steel that helps you get the best out of high speed production equipment . . . adds to the value of your finished product.

Jones & Laughlin

STEEL CORPORATION — *Pittsburgh*

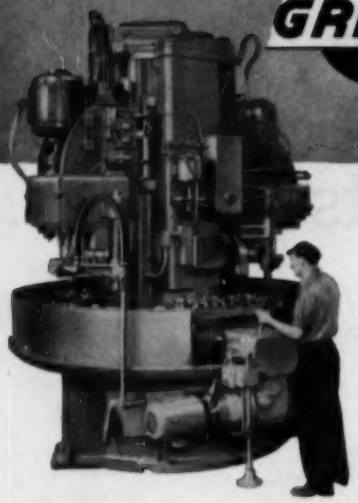
J&L STEEL

PRODUCTION MACHINERY

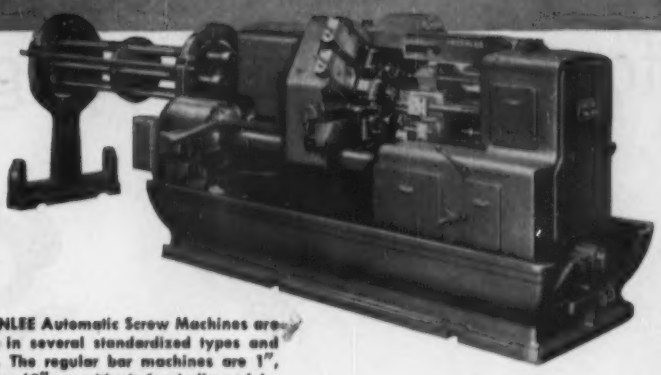
GREENLEE AUTOMATICS

PRODUCTION MACHINERY

GREENLEE SPECIAL MACHINES



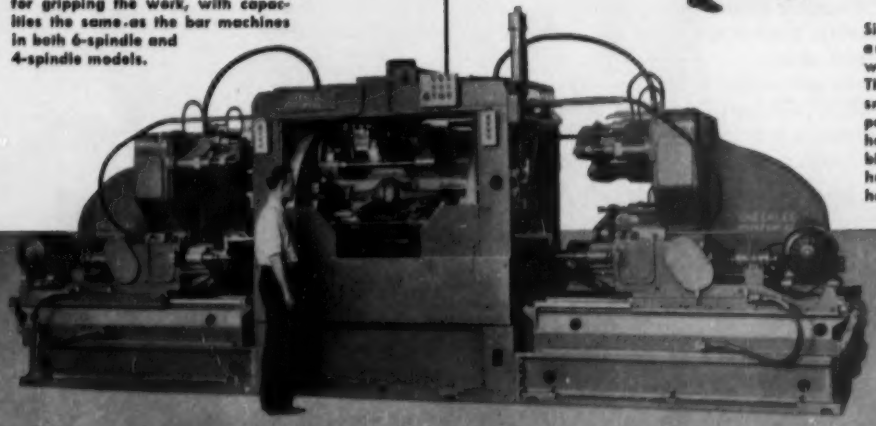
This is an example of a Vertical-type Special-purpose Four-station Automatic Indexing Machine designed and built to perform a number of important operations on connecting rods for an automobile engine.



GREENLEE Automatic Screw Machines are made in several standardized types and sizes. The regular bar machines are 1", 1⅛", and 2" capacities in 6-spindle models, and 1⅜" and 2⅛" in the 4-spindle models. GREENLEE Automatics have a number of distinctive features which help to lower costs on both long-run and short-run jobs.

GREENLEE Automatics are also made for second operation work, an example of which is shown here. Collets are used on these machines for gripping the work, with capacities the same as the bar machines in both 6-spindle and 4-spindle models.

Since 1935 GREENLEE has pioneered in the design and manufacture of Automatic Transfer Machines widely used in the big mass-production factories. The example shown here is a comparatively small and compact six-station machine which performs a group of operations on the ends and head faces of a V-8 cylinder block. Some of the bigger GREENLEE Transfer Machines will do several hundred operations in a cycle time of less than half a minute.



At the left is another GREENLEE Special Machine, in this case a Horizontal, Two-way, Four-station, Drilling, Boring, and Tapping Machine for finishing a series of holes in the ends of rear-axle housings. GREENLEE experience is available for the design and manufacture of a wide range of such cost-reducing machines.

GREENLEE BROS. & CO. 1801 Mason Ave., Rockford, Illinois

MULTIPLE-SPINDLE DRILLING, BORING, TAPPING MACHINES • AUTOMATIC SCREW MACHINES • AUTOMATIC TRANSFER MACHINES

Specify Bridgeport Phosphor Bronze◆

to make better spring parts . . .

for longer service life in switches,

relays and other electronic equipment

Bridgeport Phosphor Bronze (Alloys 35 and 36) has excellent resiliency, high flexural strength, good conductivity with superior corrosion resistance and ability to resist wear.

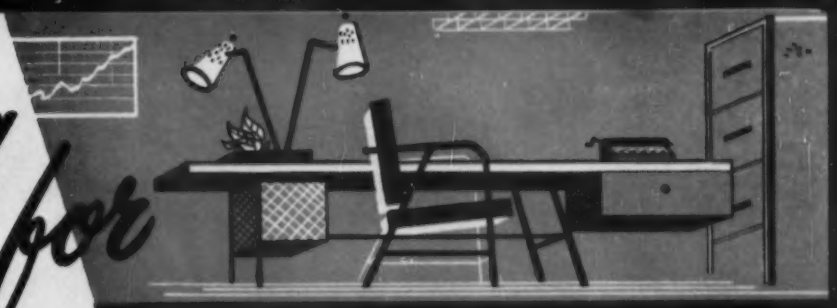
To use these advantages of Bridgeport Phosphor Bronze for your applications, contact your local Bridgeport Sales Office. Our technical service is always available to help you with your metals or methods problems.

◆ *One of the many Bridgeport Metals with High I.Q. (Inner Quality) for economical fabrication and improved products.*

BRIDGEPORT BRASS COMPANY ◆ BRIDGEPORT, CONNECTICUT

Serving Industry with a Nationwide Network of Conveniently Located Sales Offices and Warehouses
Mills in Bridgeport, Conn., Indianapolis, Ind., and Adrian, Mich.
In Canada: Noranda Copper and Brass Limited, Montreal

looking for metal furniture ideas?



Could be you are overlooking a good bet if you aren't familiar with what Van Huffel can do in cold forming metal shapes and tubing.

To give you a better picture of how other manufacturers are cutting costs and improving their products, we have prepared a portfolio of ideas that should be in your file. It's yours free for the asking.

FREE FOR YOUR FILES

VAN HUFFEL TUBE CORPORATION
WARREN, OHIO

Please send me the METAL FURNITURE idea portfolio MF-11

NAME_____

TITLE_____

COMPANY_____

ADDRESS_____

CITY_____ STATE_____

MELTRITE
PIG IRON

The Right Analysis For Your Needs

MORE USED THAN ANY OTHER MERCHANT PIG IRON

At each of the five plants, Meltrite is made of the required analysis for the particular need. Thus, specifications are met for many different grades—all Meltrite.

Toledo "A" Furnace

Foundry Service Department available without obligation

PICKANDS MATHER & COMPANY
Union Commerce Building • Cleveland 14, Ohio
Chicago • Detroit • Erie • St. Louis

IRON ORE • PIG IRON • COAL • COKE

Ten Million TOCCO-Hardened Axle Shafts

Battery of TOCCO machines for hardening automotive axle shafts. TOCCO*-hardened shafts show an increase of up to 200% in resistance to torsional fatigue over furnace-hardened shafts made of alloy steel.

Give Super Service to American Motorists

...Save Manufacturers $2,000,000

The application of TOCCO* Induction Heating to the surface hardening of rear axle drive shafts for passenger cars and trucks provides a fine example of how a less expensive manufacturing method often results in the best possible end product.

For instance, TOCCO* Induction Hardening permits the substitution of easier machining carbon steels for expensive alloys, saving from 25¢ to 55¢ per car in material costs alone. Additional savings result from the fact that TOCCO eliminates the need for annealing, tempering and shot peening operations formerly required. Moreover, long hauls to and from the heat-treating department are eliminated because cool, clean TOCCO* fits right in the production line—next to related operations.

If you make parts that require hardening, annealing, brazing, or heating for forging or forming, it can pay you handsome dividends to investigate TOCCO* Induction Heating as a sound method of improving product quality *while reducing costs.*

THE OHIO CRANKSHAFT COMPANY

TOCCO

Mail Coupon Today

NEW FREE BULLETIN

THE OHIO CRANKSHAFT CO.
Dept. A-1, Cleveland 1, Ohio
Please send copy of "Typical Results of TOCCO Induction Hardening and Heat Treating."

Name_____
Position_____
Company_____
Address_____
City_____ Zone____ State_____

(Advertisement)

Why ALDRICH PUMPS Reduce Maintenance Cost

ALDRICH

Write for catalogs, engineering service or a representative's call. We invite your inquiries.

Design simplicity . . . rugged construction

Aldrich Pumps are built to take punishing service year after year. You can find Aldrich Pumps, today, in good running order after 30, 40 and even 50 years of service. Durability such as this is the result of Aldrich's design simplicity and rugged construction.

Accessibility . . . sectionalization

When wearing parts are due for replacement, in Aldrich Pumps they can be replaced easily, quickly and at low cost. For instance, manifolds can be moved out on the holding studs and you can lift out and replace valves as complete units. . . . Stuffing boxes are particularly accessible—making it easy to renew packing. . . . To meet a change in pressure or capacity requirements, plunger sizes can be changed — in most cases merely by using new glands, throat bushings and packing in the same fluid-end. . . . Wearing parts are interchangeable among pumps of the same stroke size. . . . Fluid-ends are sectionalized to make possible low cost parts replacement and can be made of stainless steel, bronze, Monel or other material.

Aldrich Pumps Are Used for Hydraulic Systems Involving Operations Such As:

Forging	Stamping
Extrusion	Die Casting
Molding	Descaling

Roll Balancing

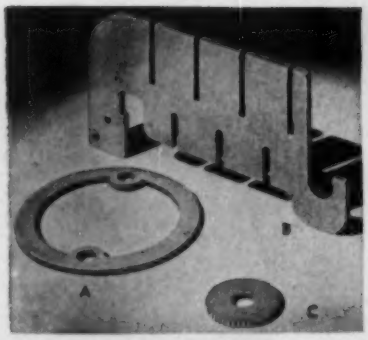
Water as Hydraulic Medium Cuts Fire Risk

With Aldrich Pumps *water*—as well as oil—can be used as hydraulic medium. With water, you can eliminate chances of plant damage or injuries due to oil fire . . . and you can reduce hydraulic fluid costs.

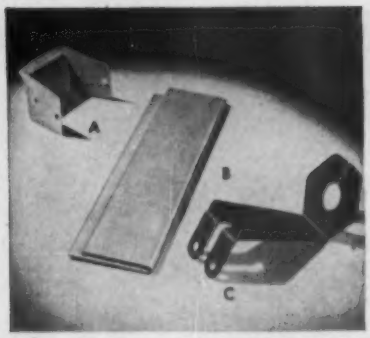
Representatives in Principal Cities

The Aldrich Pump Company

8 Pine Street · Allentown · Pennsylvania



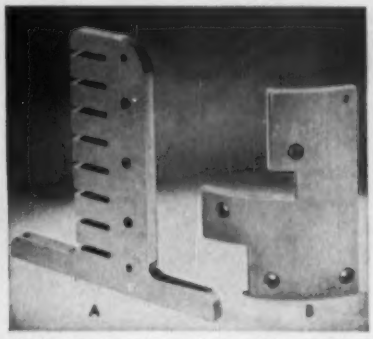
A. Sheet stock, shear strips, punch. B. Sheet stock, shear, punch blank, gang saw notches. C. Sheet stock, shear strips, punch blank, mill notches.



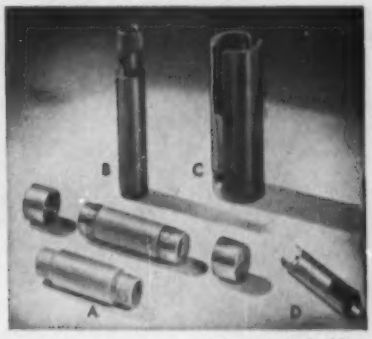
A. Sheet stock, shear strips, punch, form. B. Sheet stock, shear to size, drill, form. C. Sheet stock, shear strips, punch pieces, form in mold twice, rubber stamp twice.

A. Rod (hexagonal), smooth saw, automatic screw machine, turn shoulder thread, champfer and cut off. Remainder are automatic screw machine parts made from Diamond Fibre by C-D-F.

A. Sheet stock, sand, smooth saw to size, smooth saw bevel, smooth saw corner cut out, drill. B. Sheet stock, band saw, turn OD, bore ID, smooth saw side, drill five blind holes with jig. C. Sheet stock, sand, band saw, rough bore ID, hob teeth, finish bore ID, machine keyway.



A. Sheet stock, sand, smooth saw, drill, smooth saw to shape, radius three corners, gang saw notches. B. Sheet stock, band saw rough blanks, form, smooth saw width, length and shape, radius edges, drill with jig, countersink.



A. Tube, automatic screw machine, turn shoulders, champfer and thread end, thread other. B. Tube (long pieces), smooth saw, tap threads, screw machine, (small pieces) auto. screw machine, thread, knurl, champfer, cut off. C. Tube, smooth saw to length, punch twice, countersink. D. Tube, automatic screw machine, champfer, cut off, punch.

C-D-F fabricates and forms DIAMOND VULCANIZED FIBRE

FAST . . . AT LOW COST . . . DEPENDABLY

Vulcanized Fibre is a wonderful material if you know where to use it and how to buy it. We suggest on many jobs that it's best to do the fabrication and forming in C-D-F's shops. Why? Because C-D-F knows how. Since 1895 the company has put fibre to work in everything from buggy axle bushings to metal clad radio parts. The handling of thousands of set-ups for high speed, low cost production runs gives C-D-F an "experience bank" to draw from. Shop supervisors have a wealth of short cuts, little tricks that result in lower prices for you. They know the material and its peculiarities.

TOUGH, RESILIENT, STRONG

How long has it been since you examined the unique properties and wide range of C-D-F fibre grades? Vulcanized Fibre is arc resistant, mechanically strong, non-corroding, half the weight of aluminum. Repeated moistening and drying in forming insignificantly alters the nature, structure or quality of the fibre.

Since C-D-F has their own paper mill, uniform, quality control is made possible. Special grades are more easily developed. A good example is C-D-F Abrasive Fibre, a medium density fibre with excellent resin and grit adhesion, now widely used for abrasive discs.

A BIG, RELIABLE SOURCE

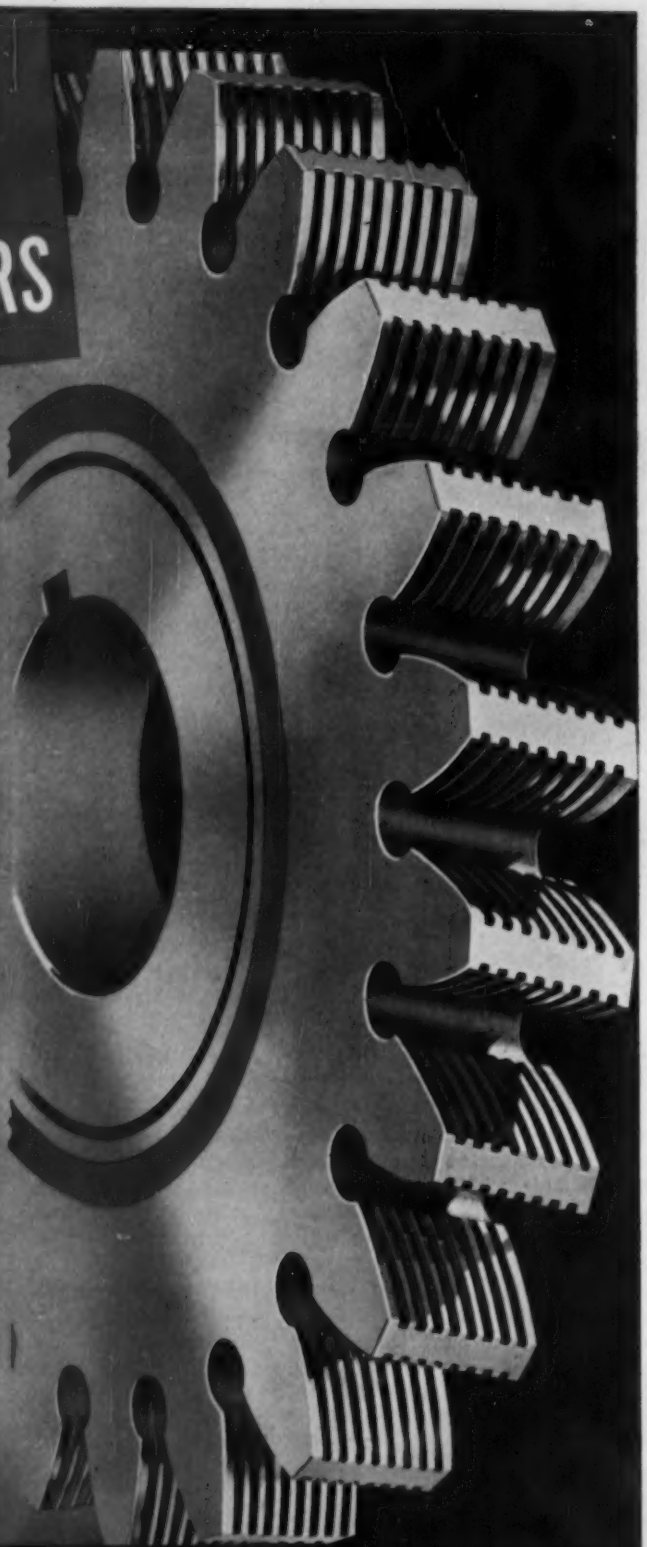
C-D-F does business with the largest tonnage users of sheet, rod and tube fibre in the world. This means good deliveries, good prices, reliable products for every new customer. You deal with a materials engineer, a C-D-F man who knows how to give you the most value in Diamond Vulcanized Fibre. If you want to improve design, simplify purchasing, speed production, use Diamond Fibre and the facilities of C-D-F. Write for catalog, free test samples, or send us your print for quotation.

CDF *Continental-Diamond Fibre*

CONTINENTAL-DIAMOND FIBRE COMPANY

NEWARK 85, DELAWARE

CHECK LIST FOR BUYERS OF SHAVING CUTTERS



Knowing the absolute necessity for QUALITY in your gear shaving cutters, you might consider these points the next time you order.

1. How much experience does the cutter manufacturer have?

   Since 1932 when National Broach built the first Rotary Gear Shaving Machine, this company has always been the largest producer of shaving cutters.

2. Has the cutter manufacturer a staff of engineer specialists who concentrate exclusively on cutter design?

   National Broach has such a staff.

3. Does the cutter manufacturer heat treat his own tools and is his grinding department temperature controlled?

   Every Red Ring Cutter is heat treated and controlled by Red Ring metallurgists and ground on special Red Ring grinders under precise temperature control.

4. Does the cutter manufacturer prove every cutter design by actual try-out in his own plant before it is released?

   No new Red Ring cutter design is ever released otherwise.

5. Is the cutter manufacturer prepared to assist you in cutter development — involute modification, etc. when needed?

   National Broach has always maintained such a service for you.

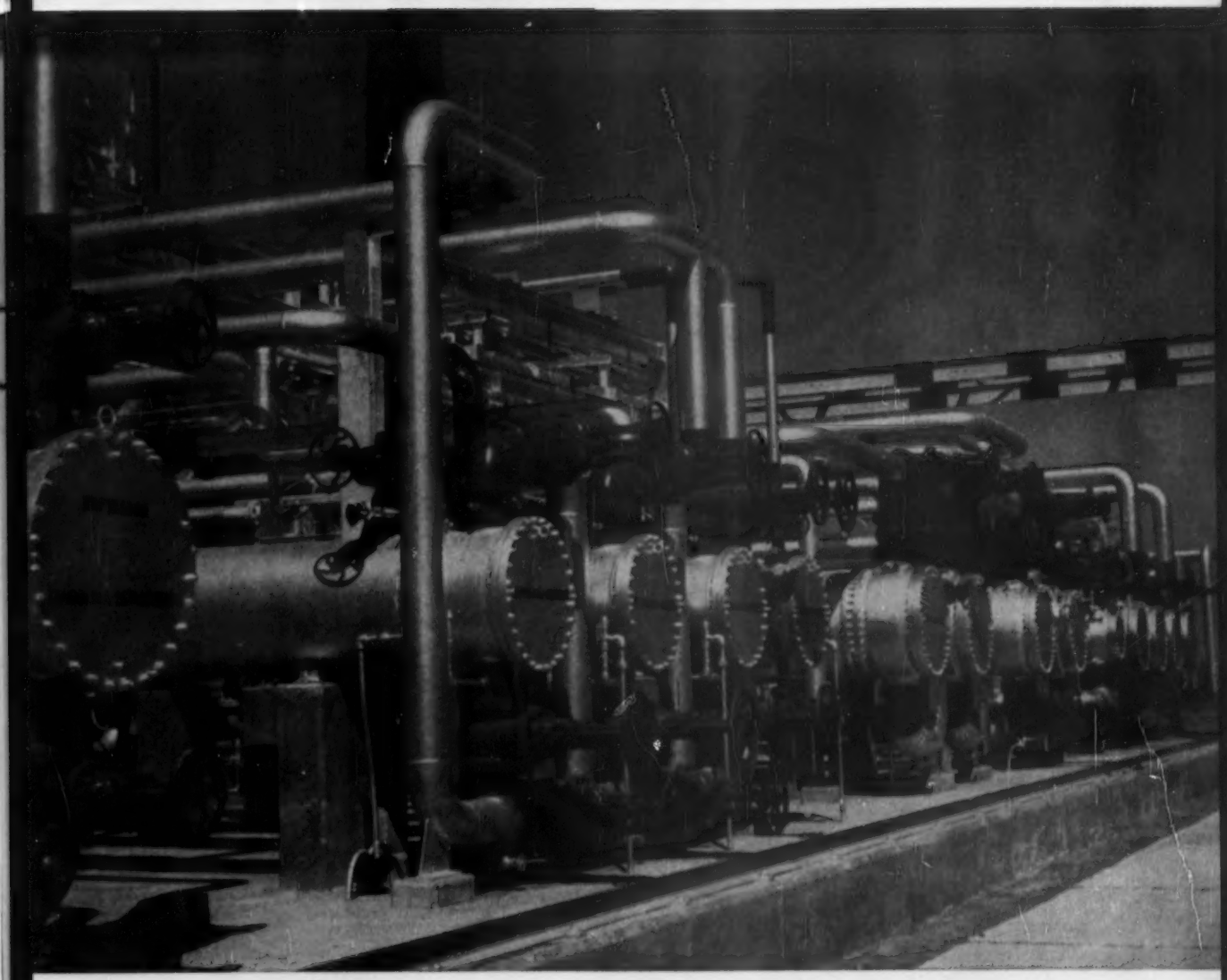
For further information, write for Chapter 2, Modern Methods of Gear Manufacture.

NATIONAL BROACH & MACHINE CO.

5600 ST. JEAN . . . . . DETROIT 13, MICHIGAN

7029

WORLD'S LARGEST PRODUCER OF GEAR SHAVING EQUIPMENT



Rolled hub type flanges on these Ross Exchangers meet exacting demands of modern refineries

Modern petroleum refineries, like the one illustrated, demand the best obtainable in heat exchanger construction and materials.

The rolled, hub style flanges, on this line-up of Ross Exchangers, are an important example. They are universally recognized by all codes (TEMA, API-ASME, ASME), manufacturers and users, as the highest grade construction.

It'll pay you to investigate how you can benefit by using Standard Steel Works' rolled, weldless rings or flanges. Wherever you are now using castings or weldments, it's likely that we can show you how to improve your product or plant by switching to SSW forgings.

For further facts about how forgings can help you, please write to our Department 8916, Standard Steel Works Division, Baldwin-Lima-Hamilton Corporation, Burnham, Pennsylvania.

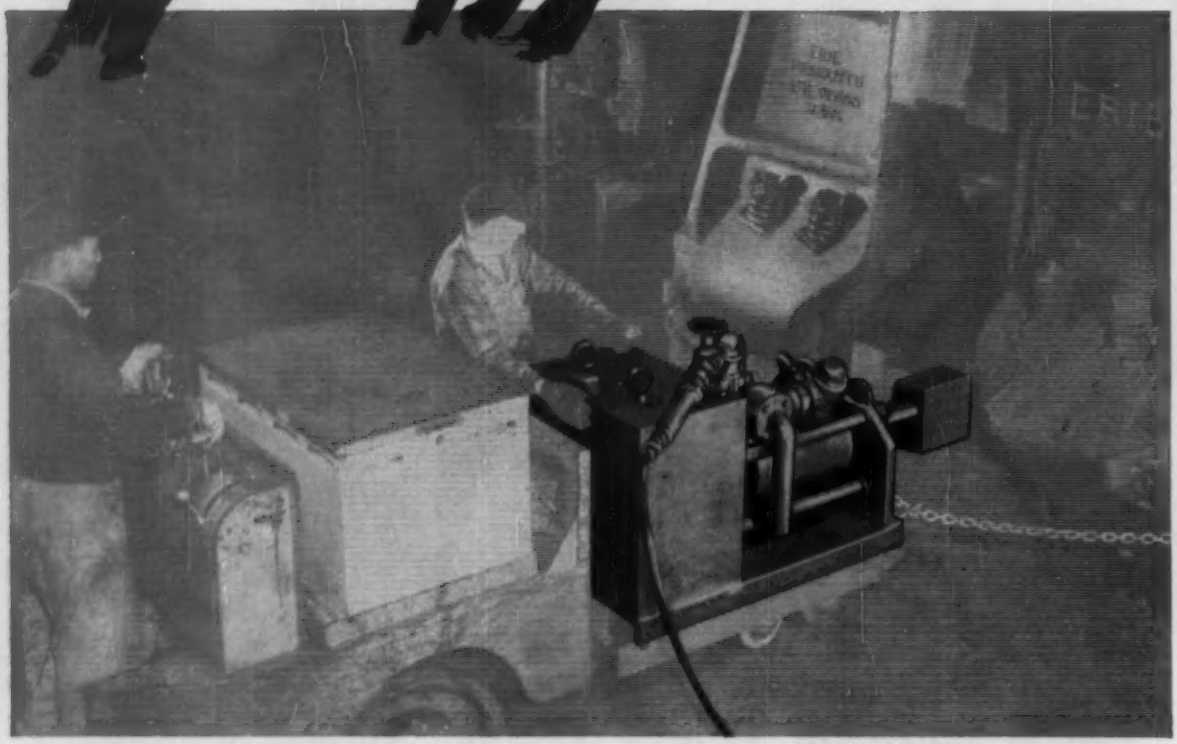
Standard Steel Works Division

Burnham (Mifflin County), Pa.

BALDWIN-LIMA-HAMILTON

General Offices: Philadelphia 42, Pa. • Offices in Principal Cities

IF YOU ARE STILL LOSING 20 MAN-HOURS DRIVING KEYS . . .



THE NEW ERIE KEY DRIVER

lets you drive keys safely . . . . . in one man-hour

STOP DRIVING A SPIKE WITH A TACK HAMMER!

Now, when driving die and sow block keys in forge hammers, the new Erie Key Driver will do with *two* men in *15* minutes what used to take *5* men (don't forget the crane operator) several hours! Let Erie Foundry Co. show you how to save maintenance man-hours, eliminate wasteful down time, reduce accidents.

THE NEW ERIE KEY DRIVER IS SAFE

There's no danger of ram end-swing, no glancing blows, minimum mushrooming of keys. Every Erie Key Driver blow is true. One user says,* "The incidence of personal injury and property damage has been reduced to a relatively negligible nature by using the very efficient Erie Key Driver."

**Name furnished upon request.*

Write for Bulletin No. 356 today

ERIE FOUNDRY CO. ERIE, PA.

THE GREATEST NAME IN FORGE HAMMERS

ERIE

one foot or a trainload...

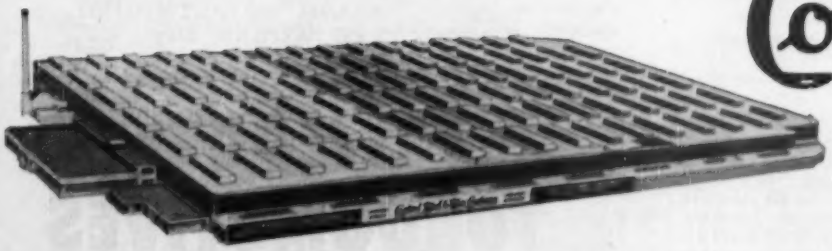
you can be sure of

Quality and Service

Our quality control and identification system make it possible always to deliver the exact metal you need . . . precision-cut to your exact specifications by experienced personnel.

Your order receives prompt, careful attention. Dependable, "hurry-up" delivery anywhere in the Middle West.

Central Steel & Wire Company



PLANTS and OFFICES

CHICAGO 80, ILL. P.O. Box 5310-A, REpublic 7-3000
DETROIT 12, MICH. P.O. Box 148 Hamtramck Sta., TWinbrook 2-3200
CINCINNATI 14, OHIO Box 148 Annex Sta., AVon 2230
MILWAUKEE 1, WIS. Box 1154, EVergreen 4-7400

A Plymouth Switcher Keeps Freight Cars Moving at Westinghouse Electric!

This powerful 10-ton Plymouth Diesel pulls up to 14 loaded freight cars at one time, over 35 miles of track, for the Columbus, Ohio, plant of Westinghouse Electric. The work schedule is 30 hours each week. Yet fuel consumption averages less than a gallon an hour, and only very minor maintenance has been required in 2 years of operation.

It's good business to replace obsolete, inefficient haulage equipment with a Plymouth Locomotive. Models are available from 3 to 70 tons . . . gasoline and Diesel-mechanical, gasoline and Diesel-Torqomotive, or Diesel-electric drive. We will be glad to make a free analysis of *your* special problem. Write today. . . . Address the PLYMOUTH LOCOMOTIVE WORKS, Dept. A-2, Plymouth, Ohio.

Send for the complete, illustrated catalog, containing data on all standard Plymouth Locomotives for narrow and standard gauge track.

PLYMOUTH® TORQOMOTIVES

Torqomotive — Plymouth Transmission with Hydraulic Torque Converter

ALSO MANUFACTURERS OF F-R-H CERAMIC MACHINERY

The answer to most of your questions about stainless steels are right at your finger tips, when you use Crucible's unique new Stainless Steel Selector.

Want to know the machinability characteristics of a stainless grade? Resistance to corrosion or scaling? Physical or mechanical properties? You can get the answers to these and other questions simply by setting the arrow on the Selector slide at the proper window. It's just as quick and easy as that.

And almost as fast as you get the answer, you can get the steel you need. For many of the REZISTAL stainless steels shown on the Selector are carried in stock in Crucible warehouses conveniently located throughout the country.

To get your free copy just fill in and mail the coupon. Better do it now.

HOW THE SELECTOR WORKS:

Start with the problem. For example, resistance to corrosion in contact with copper sulfate. Just set the slide at the proper index number shown on the Selector (in this case on the back), and you have the answer in a second – grades 302 and 316 are fully resistant to this form of attack.

Crucible Steel Company of America
Dept. I, Henry W. Oliver Building
Pittsburgh, Pa.

Name_____

Company_____ Title_____

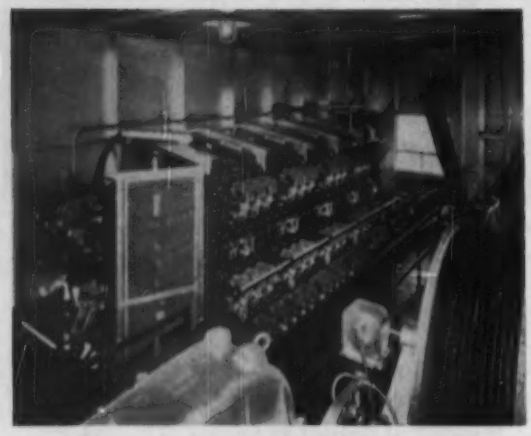
Address_____ City_____ State_____

CRUCIBLE first name in special purpose steels

54 years of Fine steelmaking **STAINLESS STEELS**

CRUCIBLE STEEL COMPANY OF AMERICA, GENERAL SALES OFFICES, OLIVER BUILDING, PITTSBURGH, PA.

KING SIZE Barge-Crane shown with 62½-Long Ton Test Load on 50-Long Ton Floating Crane. Built by Wiley Mfg. Co., Port Deposit, Md.



View above shows EC&M Crane Protective Panel at left, row of EC&M Magnetic Controllers with the well-known LINE-ARC Contactors and TIME-CURRENT Relays, and EC&M Cam Master Switches (arranged for remote operation) at the extreme right. Adjacent to the hoist drum in the foreground is an EC&M Rotating Cam Limit Switch and beyond this an EC&M Type WB Brake partially shows.

Wiley Manufacturing Company takes advantage of the inherent safety and quick response in operation of series-wound brakes and the simplicity and excellent characteristics of series motors for the main, auxiliary and whip-hoists and luffing motion of their barge-cranes.

The EC&M Wright Dynamic Lowering Circuit Controller used on these motions prevents heavy peak loads on the Diesel Generator, because:

(1) ALL line current passes through the brake coil on the first point lowering, giving quick brake release with minimum power.

(2) EC&M TIME CURRENT Relays retard the rate of acceleration of heavy loads in hoisting, yet allow faster operation with light loads. And for rotating the crane, TIME-CURRENT Relays govern the rate of acceleration of the swing motion with topmost smoothness.

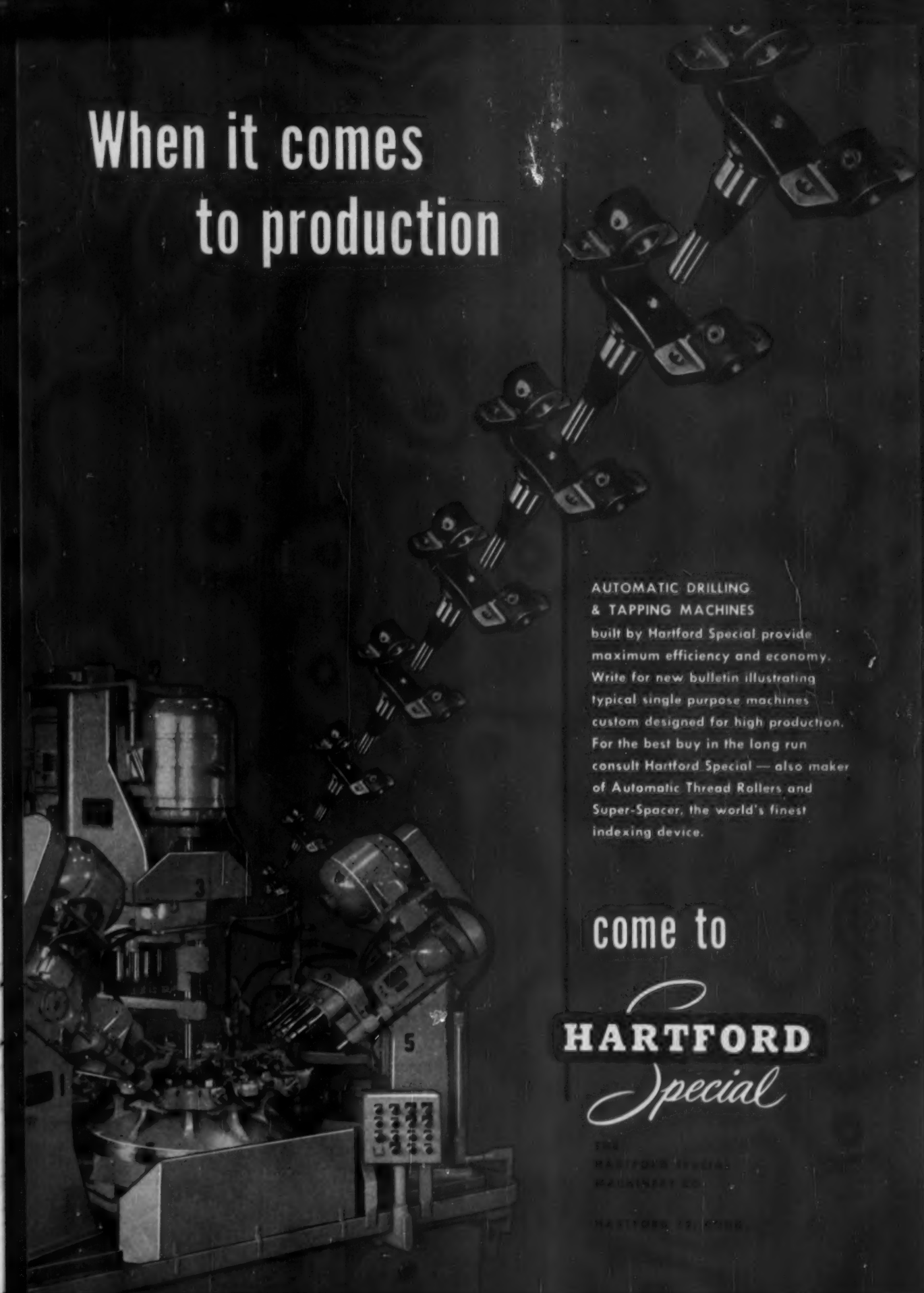
Specify EC&M Control to get these exclusive advantages.

1701

THE ELECTRIC CONTROLLER & MFG. CO.

2698 East 79th Street ★ Cleveland 4, Ohio

When it comes to production



AUTOMATIC DRILLING & TAPPING MACHINES built by Hartford Special provide maximum efficiency and economy. Write for new bulletin illustrating typical single purpose machines custom designed for high production. For the best buy in the long run consult Hartford Special — also maker of Automatic Thread Rollers and Super-Spacer, the world's finest indexing device.

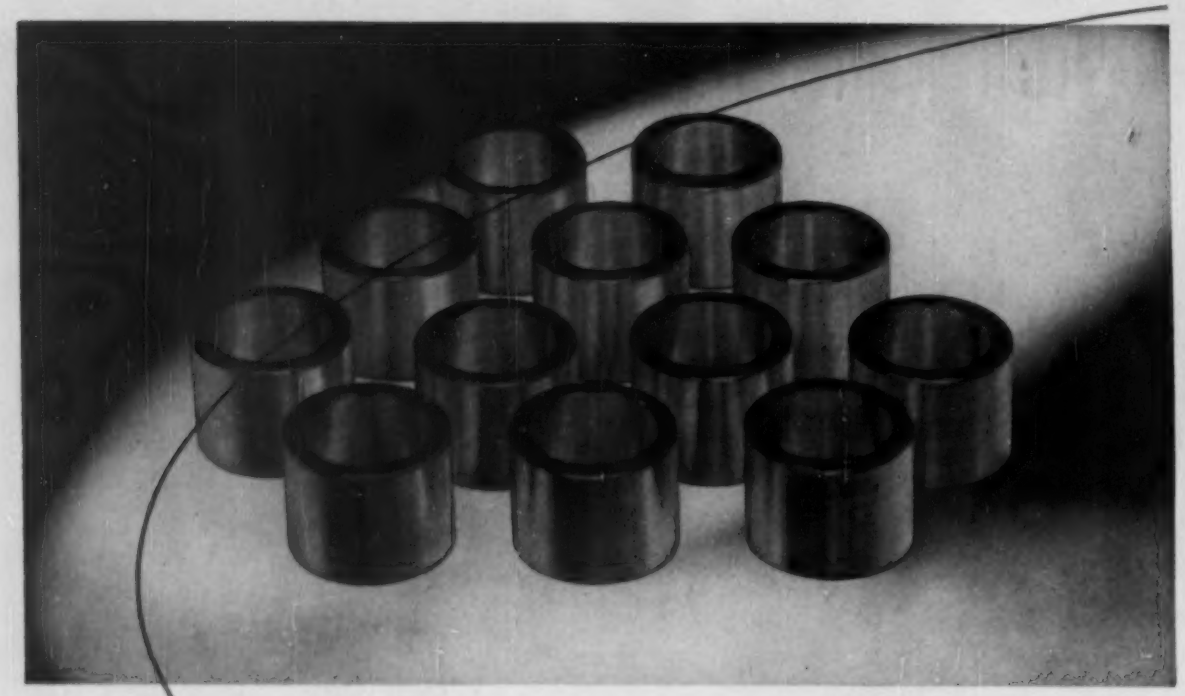
come to

HARTFORD *Special*

THE HARTFORD SPECIAL MACHINERY CO.

HARTFORD 12, CONN.

No. 9 in a Series



these requirements in mind...

So varied are the demands on multiple spindle automatics it is impossible to design into one model — or a number of models — all the facilities that will satisfy every requirement. To excel in any range of work the design of a machine of this type must be directed toward that work.

Cone's new General Datalog lists over forty CONOMATIC models that are designed with these requirements in mind. For any range of work, Conomatics are built to more efficiently serve the latest cutting tool materials.

data for comparison

Part	Bushing
Machine	1¼" Six Conomatic
Tools	100% Carbide Tipped
Material	Stainless Steel Tubing
Stock Size	1¼" OD; ¾" ID
R. P. M.	Work Spindle — 1033 Opposed Spindle—1048
Time	7 Seconds per Cycle 3.5 Seconds per Piece

Conomatic } CONE AUTOMATIC MACHINE COMPANY, INC. WINDSOR, VT., U.S.A.

ALLOY and STAINLESS STEELS

BILLETS • SLABS • HOT ROLLED AND COLD FINISHED BARS

Rotary Electric Steel Co.

P. O. BOX 4606 • DETROIT 34, MICHIGAN

Rotary offers quality . . . now more than ever before, with newly expanded and improved manufacturing facilities. But what is more important, ROTARY OFFERS SERVICE.

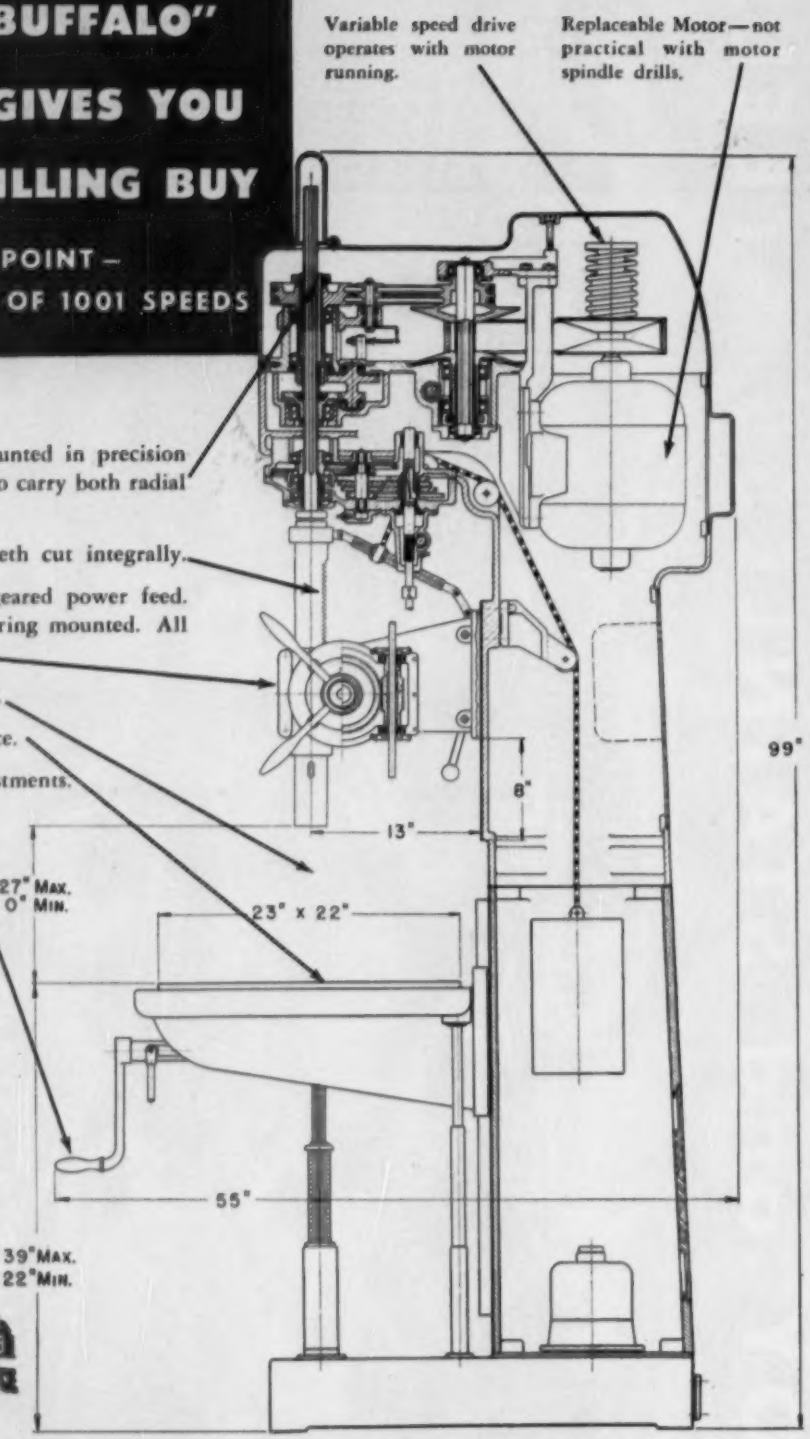
A personal type of service that considers deadlines all-important and sees to it that deliveries are made on time . . . a service that is flexible enough to speed-up production schedules in order to meet specific customer needs. A servic you can rely on.

Complete facilities for annealing and heat treating

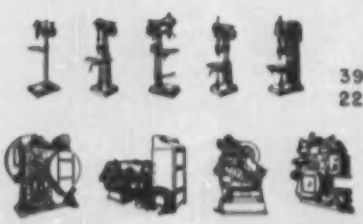
SALES OFFICES: Chicago, Cleveland, Newark, Indianapolis, Fayetteville, N. J., Houston

HOW THE "BUFFALO" "Q" Factor* GIVES YOU THE BEST DRILLING BUY

A CASE IN POINT — THE "RPMster" DRILL OF 1001 SPEEDS


Variable speed drive operates with motor running.
Replaceable Motor—not practical with motor spindle drills.
6-spline alloy steel spindle mounted in precision ball bearings of sufficient size to carry both radial and thrust loads.
Alloy steel quill with rack teeth cut integrally.
Sturdy, simple, foolproof all-geared power feed. Alloy steel back gears ball bearing mounted. All controls easily reached.
Maximum space for your work.
500 square inch working surface.
Convenient crank or lever adjustments.
99"
8"
13"
27" Max.
0" Min.
23" x 22"
55"
39" Max.
22" Min.

*These are just a few of the features that go into the "Buffalo" "Q" Factor — the built-in Quality that provides trouble-free satisfaction when you specify "Buffalo". Write for Bulletin 3257B for further details on this top drill value!



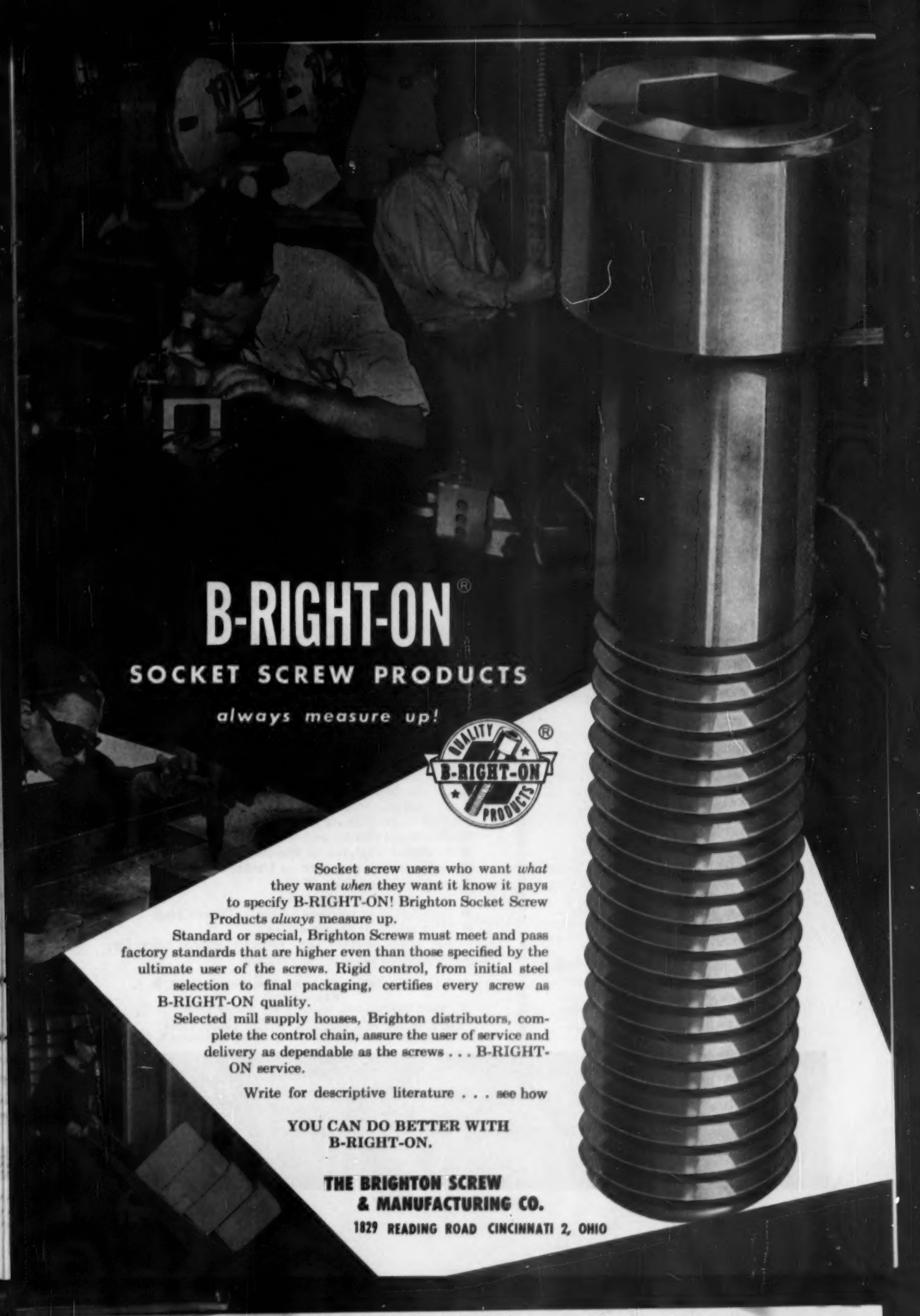
"Buffalo"

BUFFALO FORGE COMPANY

492 BROADWAY BUFFALO, N.Y.

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

DRILLING • PUNCHING • SHEARING • BENDING



B-RIGHT-ON®

SOCKET SCREW PRODUCTS

always measure up!

QUALITY B-RIGHT-ON® PRODUCTS

Socket screw users who want *what* they want *when* they want it know it pays to specify B-RIGHT-ON! Brighton Socket Screw Products *always* measure up.

Standard or special, Brighton Screws must meet and pass factory standards that are higher even than those specified by the ultimate user of the screws. Rigid control, from initial steel selection to final packaging, certifies every screw as B-RIGHT-ON quality.

Selected mill supply houses, Brighton distributors, complete the control chain, assure the user of service and delivery as dependable as the screws . . . B-RIGHT-ON service.

Write for descriptive literature . . . see how

YOU CAN DO BETTER WITH B-RIGHT-ON.

THE BRIGHTON SCREW & MANUFACTURING CO.

1829 READING ROAD CINCINNATI 2, OHIO

An example of the HIGH FATIGUE LIFE you can get in SANDVIK SPRING STEEL

Compressor valves are one of the uses of Sandvik steel demanding extra high fatigue life. In the performance of their extremely vital job in the heart of a compressor, these valves vibrate many, many times per second. The fact that they are required to give years of trouble-free service is evidence of the fatigue resistance you'll find in Sandvik steels.

DO YOU HAVE YOUR COPY OF THIS FREE, NEW SANDVIK CATALOG?

Lists hundreds of sizes usually carried in stock. Gives thickness, width, hardness, types of edges and weight in pounds per hundred feet. Also useful conversion tables. Write, on your letterhead, today.

When you need a spring steel that won't "tire" easily remember Sandvik.

This high fatigue life available in Sandvik steels is a result of the basic purity of raw materials used and close controls maintained throughout all processing.

Sandvik strip steels are available:

- **In straight carbon and alloy grades**
- **In special analyses for specific applications**
- **Annealed, unannealed or hardened and tempered**
- ***In thicknesses from .001"***
- **In a wide range of widths**
- **Unpolished or polished bright, yellow or blue**
- **With round or square edges**

Phone, write or wire your nearest Sandvik office for further information or technical help.

SANDVIK STEEL, INC., 111 Eighth Ave., New York 11, N. Y.
WAtkins 9-7180
220 N. Michigan Ave., Chicago 1, Ill., FRanklin 2-5638
1736 Columbus Rd., Cleveland 13, Ohio, CHerry 1-2303
3609 E. Olympic Blvd., Los Angeles 23, Cal., ANgelus 3-6761
SANDVIK CANADIAN LTD., P.O. Drawer 430, Station O, Montreal 9, P.Q.

SS-60

SOME SANDVIK SPECIALTY STRIP STEELS · Steel for Textile Machine Parts · Band Saw Steels; Metal Band, Wood Band and Spring Temper · Camera Shutter Steel · Clock and Watch Spring Steels · Compressor Valve Steel · Doctor Blade Steel · Feeler Gauge Steel · Knife Steels · Razor Blade Steel · Reed Steel · Shock Absorber Steel · Sinker Steel · Spring Steels · Trowel Steel · Vibrator Reed Steel, etc.

AGF No. 4 Rotary Carburizers and No. 71 Rotary Tempering Furnaces in the modern, efficient plant of the American Wheelabrator & Equipment Corp., Mishawaka, Indiana.

the only type of furnace that will UNIFORMLY HEAT TREAT large volume production of small work such as shot.

Heat treated steel shot as produced by the American Wheelabrator & Equipment Corp., Mishawaka, Indiana, is proven to outlast many times the previously equivalent kinds of shot, which were not heat treated. The only practical kind of furnace to do this kind of work is a rotary furnace such as illustrated.

Work handling is simplified and convenient. The constant rotation insures positive, uniform and rapid heating.

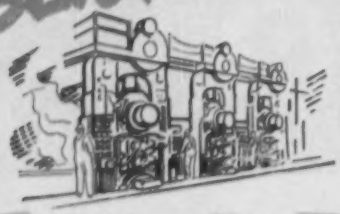
AGF factory trained engineers and metallurgists are available in principal industrial centers. Installations may be seen wherever industrial gas is available. For positive results and for practical economy call AGF PIONEERS.

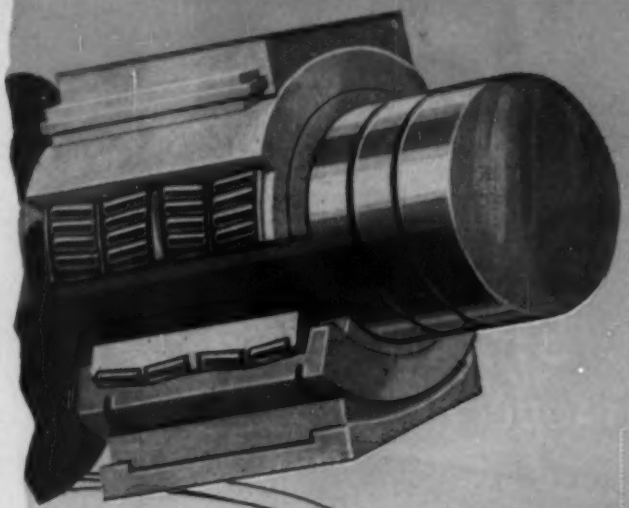
Write for Bulletins No. 1212A and 805

AMERICAN GAS FURNACE CO.

1004 LAFAYETTE STREET — ELIZABETH 4, N. J.

FOR SEVEREST ROLLER BEARING SERVICE





BROOKS * LEADOLENE 375

*THE I.P. LUBRICANT WITH *Indestructible pH-ilm*

Brooks Leadolene 375 provides safe, trouble-free lubrication of roller bearings under heaviest loads, overloads and severest shock conditions, such as experienced in heavy duty work roll service on 4 high hot strip mills, reduction mills and temper pass mills. Developed through years of research, this modern industrial lubricant provides corrosion resistance to component parts of bearing from cooling water and other contaminating actions.

Available in three grades . . .

Leadolene 375 Light: For normal or moderately high temperatures, with repellence of water a dominant factor. Excellent pumpability.

Leadolene 375 Medium: For heavier load and higher temperature requirements. Prevents leakage through seals. Excellent pumpability. Affords year around service under all temperature conditions.

Leadolene 375 Heavy: For pressure gun or system applications in normal or high temperatures. Good pumpability.

A Brooks lubrication engineer will gladly call at your request. Write, phone or wire today.

THE BROOKS OIL COMPANY
934 Ridge Avenue
Pittsburgh 12, Pa.

Please send bulletin on Leadolene 375.

NAME_____

TITLE_____

COMPANY_____

ADDRESS_____

CITY_____ ZONE____ STATE_____

I.A. 188

MAIL COUPON FOR COMPLETE DATA

The Brooks Oil Company

Since 1876

Executive Offices and Plant, Cleveland, Ohio
Executive Sales Offices, Pittsburgh, Pa.
Canadian Offices and Plant, Hamilton, Ontario
Cuban Office, Santiago de Cuba
Warehouses in Principal Industrial Cities

Now from CONTINENTAL

Single Length Wire Coils Up to 580 # Catch Weight

GET THESE ADVANTAGES WITH OUR NEW HEAVY WEIGHT COILS IN 26" DIAMETER.

- **CUTS SCRAP LOSS** *50% and More*
- **REDUCES** *Material Handling Costs When using Power Equipment*
- **LONGER** *Continuous Runs*
- **LESS DOWN TIME** *For Production Equipment*

Money-saving comes naturally when you use Continental's new 580# Catch Weight Coils. Longer runs and fewer coils to handle mean faster production because there is less down time. And your scrap loss from coil ends is cut at least in half. The new coils are tightly bound in stout metal straps. Continental specializes in high quality basic open hearth steel wire for thousands of applications in practically any size, temper, finish, shape and analysis in low carbon and medium low carbon steels. Over half a century of wire making assures top service in solving your wire problems. Investigate the new 580# Catch Weight Coil. *It's packaged for profit!*

PRODUCERS OF Manufacturer's Wire in many sizes, shapes, tempers and finishes, including Galvanized, KOKOTE, Flame-Sealed, Coppered, Tinned, Annealed, Liquor Finished, Bright, Lead Coated and special wire. Also, Coated and Uncoated Steel Sheets, Nails, Continental Chain Link Fence, and other products.

CONTINENTAL

STEEL CORPORATION • KOKOMO, INDIANA

CONTINENTAL STEEL

Quality Control in the JET AGE

BEGINS WITH

DIRECT READING ANALYSIS

- As many as 60 elements analyzed in seconds.
- Drastic reduction in furnace waiting time.
- Laboratory costs cut by two-thirds.
- Productivity greatly increased.
- A higher quality product is ensured.

Baird Associates spectrographs and spectrometers are discussed in technical bulletins #32 and #34. Please write for your free copy to Dept. SW.

Baird Associates, Inc.

33 UNIVERSITY ROAD, CAMBRIDGE 38, MASSACHUSETTS, U.S.A.

Roebling drum packs are shipped on pallets unless otherwise specified. This gives you today's easiest, least expensive method of moving and stacking wire — with a fork truck, one man can do the work of ten.

Packed to save you money!

IN ADDITION to producing top quality high carbon wire, Roebling has developed many special methods of packing ...and some *one* of these, or some other method which may be developed for your specific requirements, may save a considerable amount of time and money in your plant.

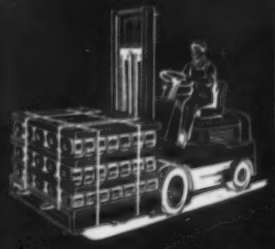
Certain types of wire, for instance, can be packed in hexagonal fibre drum packs that provide superior protection and facilitate handling and storing wire. Drum packs do not have to be returned... save you bother, storage space and freight charges.

You *pay* for the best when you buy high carbon wire. Make sure you *get* the best, in wire and packing too. Always specify Roebling. John A. Roebling's Sons Corporation, Trenton 2, N. J.

ROEBLING

Subsidiary of The Colorado Fuel and Iron Corporation

ATLANTA, 934 AVON AVE • BOSTON, 61 SLEEPER ST & 6 PITTSBURGH ST • CHICAGO, 5525 W. ROOSEVELT RD • CINCINNATI, 3253 FREDONIA AVE • CLEVELAND, 13235 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST • DETROIT, 915 FISHER BLDG • HOUSTON, 6216 NAVIGATION BLVD • LOS ANGELES, 5340 E. HARBOR ST • NEW YORK, 19 RECTOR ST • ODESSA, TEXAS, 1920 E. 2ND ST • PHILADELPHIA, 230 VINE ST • ROCHESTER, 1 FLINT ST • SAN FRANCISCO, 1740 17TH ST • SEATTLE, 900 1ST AVE S. • ST. LOUIS, 3001 DELMAR BLVD • TULSA, 321 N. CHEYENNE ST • EXPORT SALES OFFICE, TRENTON 2, N. J.



If you wish, Roebling spools will be delivered on pallets with separators, providing the easiest and most economical means of handling and stacking wire with fork truck.

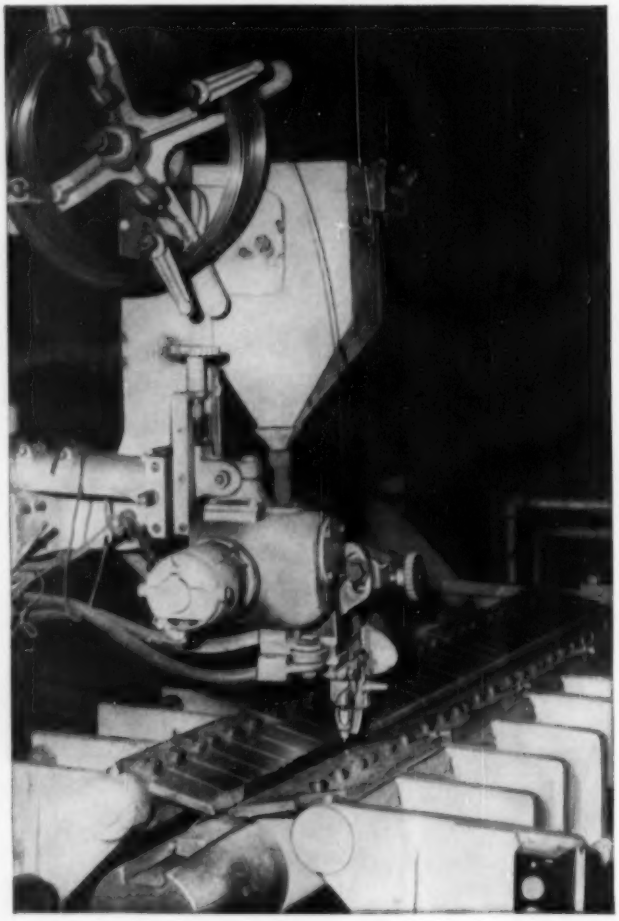
CUT *maintenance costs on tough welding jobs*

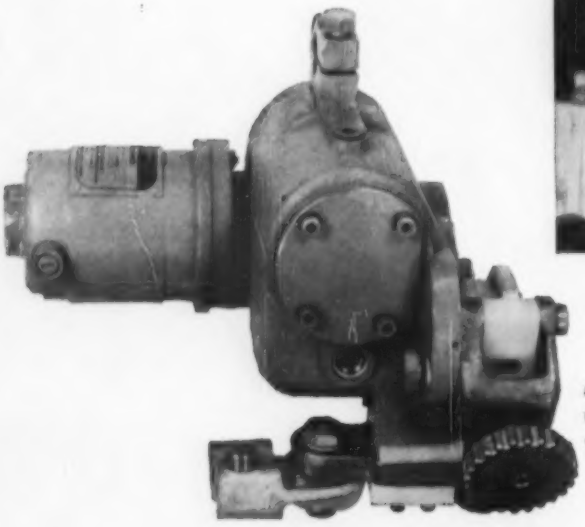
with the New UNIONMELT DSH *welding head*

Trade-Mark

Here's the low cost, submerged melt welding head that saves maintenance costs on tough welding operations. The new UNIONMELT DSH head combines the flexibility of the lighter units with the ruggedness needed in heavy-duty welding machines. Large, sturdy gears and bearings give long, trouble-free service though work may involve frequent starts and stops and feeding heavy electrode wire. Simple controls and mounting arrangements make the DSH head easy to operate and maintain.

UNIONMELT welding joins thin metals at speeds up to 200 in. per minute or makes one-pass welds with a 3-inch penetration if desired. If you have a production job in your plant that requires high-quality welds made at high speeds, ask your nearest LINDE Office today for more information about UNIONMELT welding. A LINDE Engineer will be glad to help you plan your UNIONMELT installation for high-speed, production welding.





With the new UNIONMELT DSH head now available in five output speeds, you can select the best unit you need for making high-quality low-cost welds at the highest welding speeds.

Linde Air Products Company

A Division of Union Carbide and Carbon Corporation

30 East 42nd Street UCC New York 17, N. Y.

Offices in Other Principal Cities

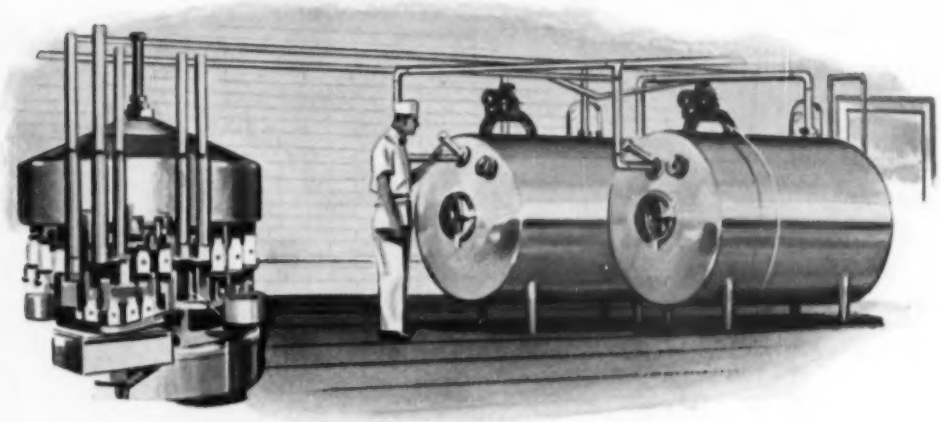
In Canada: DOMINION OXYGEN COMPANY

Division of Union Carbide Canada Limited, Toronto

The terms "Linde" and "Unionmelt" are registered trade-marks of Union Carbide and Carbon Corporation.

Linde

Trade-Mark



. . . FOR DAIRIES

. . . FOR HOSPITALS

McLouth STAINLESS Steel

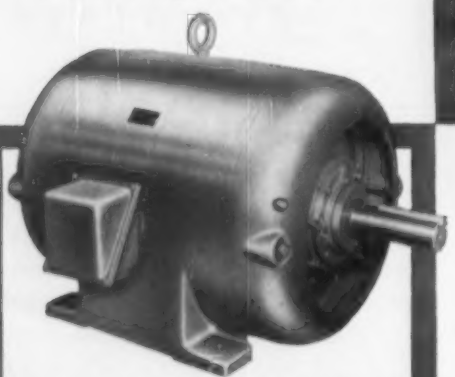
High quality stainless sheet and strip steel . . . for the product you make today and the product you plan for tomorrow.

. . . FOR THE CHEMICAL INDUSTRY

McLouth Steel Corporation
DETROIT, MICHIGAN
Manufacturers of Stainless and Carbon Steels

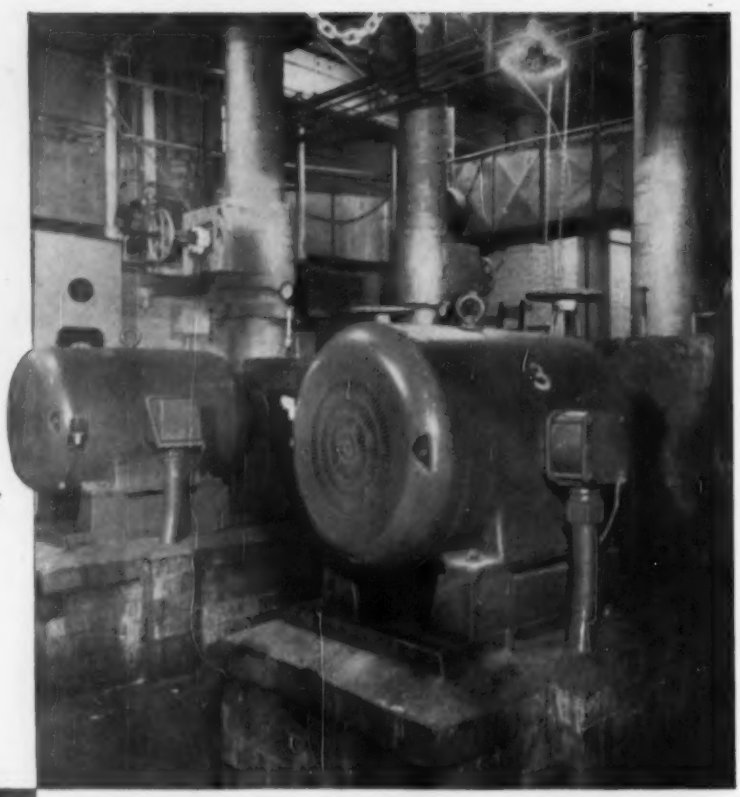
Wagner®
ELECTRIC MOTORS
...the choice of leaders in industry

use
WAGNER
Cast Iron Frame Motors for *EXTRA PROTECTION* in corrosive atmospheres



Type EP, totally-enclosed fan-cooled. Available in ratings from 2 to 250 hp.

Type JP, non-ventilated. Explosion-proof. ½ through 1½ hp.



These 150 hp Wagner Cast Iron Frame Motors drive brine pumps in an acid area at Celanese Corporation's Rock Hill, S. C. plant.

If the motors in your plant are subjected to corrosive fumes and liquids, Wagner Cast Iron Frame Motors will provide the *extra protection* you need.

These stock motors are totally-enclosed in corrosion-resistant cast iron. All parts exposed to the atmosphere are fabricated of corrosion-resistant material—even the nameplate. Features include completely protected laminations . . . special varnish treated windings . . . a running shaft seal.

Wagner Cast Iron Frame Motors are available in fan-cooled standard and explosion-proof types in ratings from 2 to 250 hp, and in non-ventilated standard and explosion-proof types in ratings from ½ through 1½ hp. Wagner Bulletin MU-132 gives complete information.

A skilled Wagner engineer will help you select the Wagner Motor to meet your most exacting specifications. Call the nearest of our 32 branch offices, or write us.

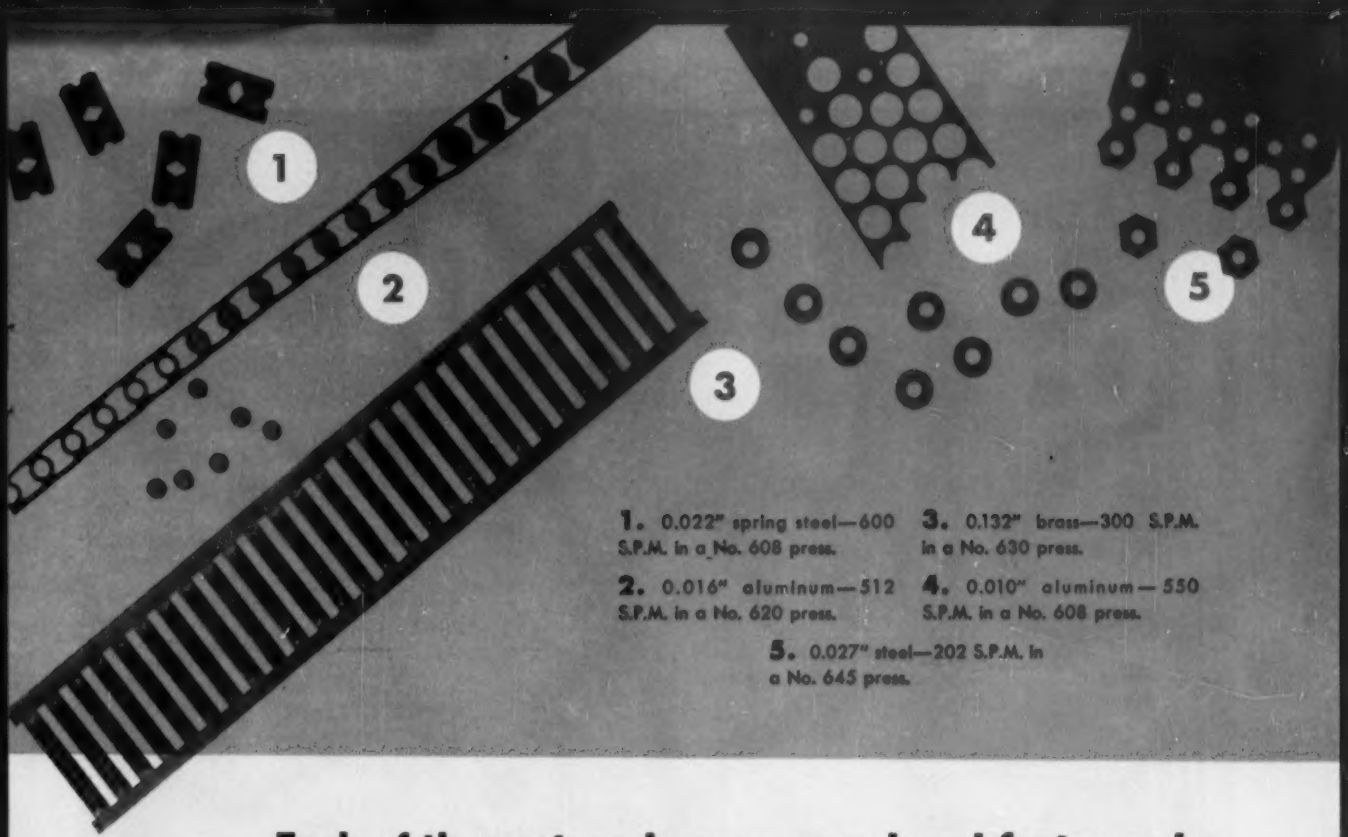
Wagner Electric Corporation
EST. 1891

WAGNER ELECTRIC CORPORATION
6403 PLYMOUTH AVE., ST. LOUIS 14, MO., U.S.A.

BRANCHES AND DISTRIBUTORS IN ALL PRINCIPAL CITIES

ELECTRIC MOTORS
TRANSFORMERS
INDUSTRIAL BRAKES
AUTOMOTIVE BRAKE SYSTEMS—AIR AND HYDRAULIC

MSB-7



1. 0.022" spring steel—600 S.P.M. in a No. 608 press.

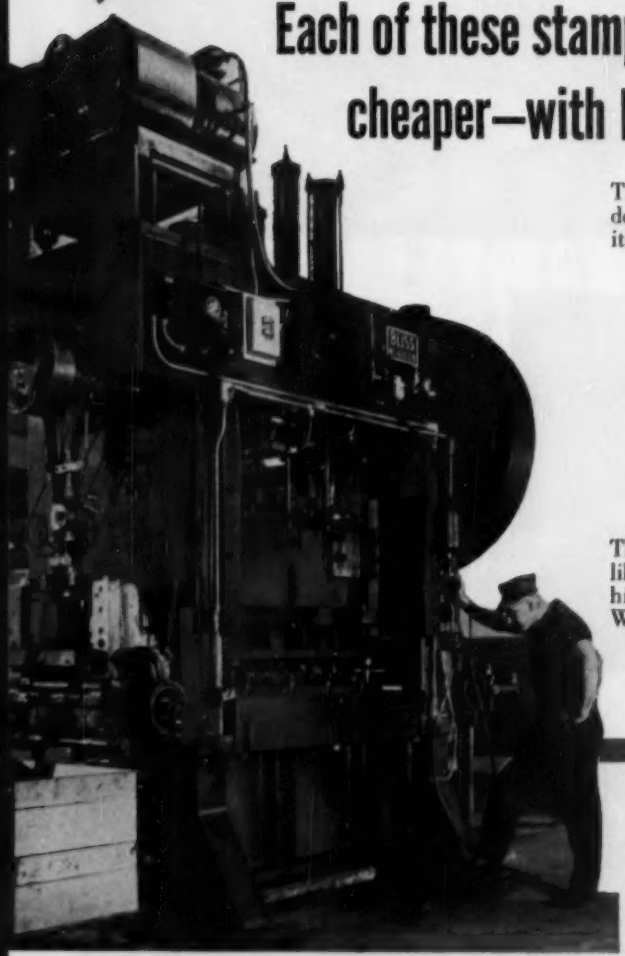
2. 0.016" aluminum—512 S.P.M. in a No. 620 press.

3. 0.132" brass—300 S.P.M. in a No. 630 press.

4. 0.010" aluminum—550 S.P.M. in a No. 608 press.

5. 0.027" steel—202 S.P.M. in a No. 645 press.

Each of these stampings was produced faster and cheaper—with BLISS High Production Presses



The Bliss 600 series of High Production Presses, especially designed and developed for high-speed stamping, has proved itself on America's faster production lines:

- At Lima Register—5 Bliss Automatic Presses replaced 65 hand-fed presses. Example of the unusual savings: floor register valve costs only 1/25th of a hand-fed stamping.
- At IBM—5 Bliss Automatic Presses are used for short run typewriter parts production—die changeover is so easy that production has been boosted "an estimated 25%".
- At Briggs & Stratton—350 magneto armature parts are turned out each minute—on one 620 Bliss High Production Press!

There's a Bliss bulletin which describes in detail examples like these—examples which may show how you can solve a high production problem of your own—with a Bliss press. Write for catalog 27-A today.

BLISS

SINCE 1857

is more than a name...it's a guarantee!

E. W. BLISS COMPANY, Canton, Ohio

PRESSES, ROLLING MILLS, SPECIAL MACHINERY

Subsidiary: The Die Supply Company, Cleveland, O. • E. W. Bliss (England) Ltd., Derby • E. W. Bliss Company (Paris) France

U. S. Plants in Canton, Salem and Toledo, Ohio; Hastings, Michigan; and San Jose, Calif. *Branch Offices* in Chicago, Cleveland, Dayton, Detroit, Indianapolis, New Haven, New York, Philadelphia, Rochester, Toledo, and Toronto, Canada. *Other representatives throughout the world.*

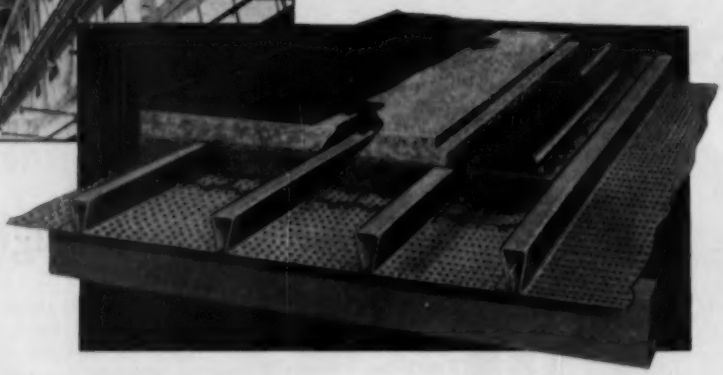
K & R

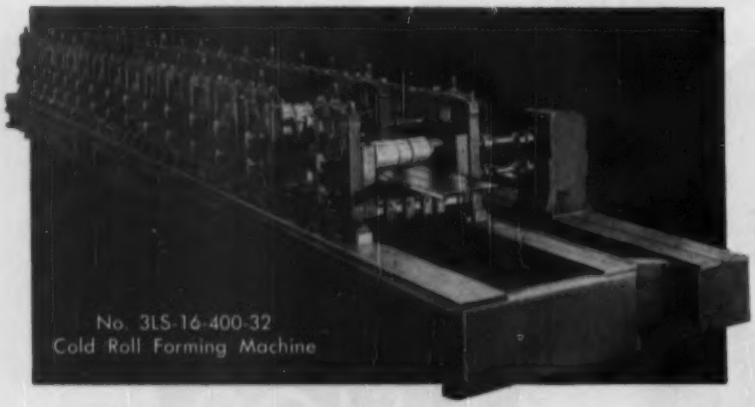
"...satisfactorily produced millions of feet of Holorib roofing", says Mr. N. E. Hubbell

Buffalo Plant Mgr.
Detroit Steel Products Company

"Since 1930 Kane & Roach machinery has satisfactorily produced millions of feet of Holorib roofing — a section which cannot be easily roll formed. When our production increased we called on K & R in 1946 to furnish additional equipment."

Shown above: Installation of Fenestra Acoustical Holorib Ceiling





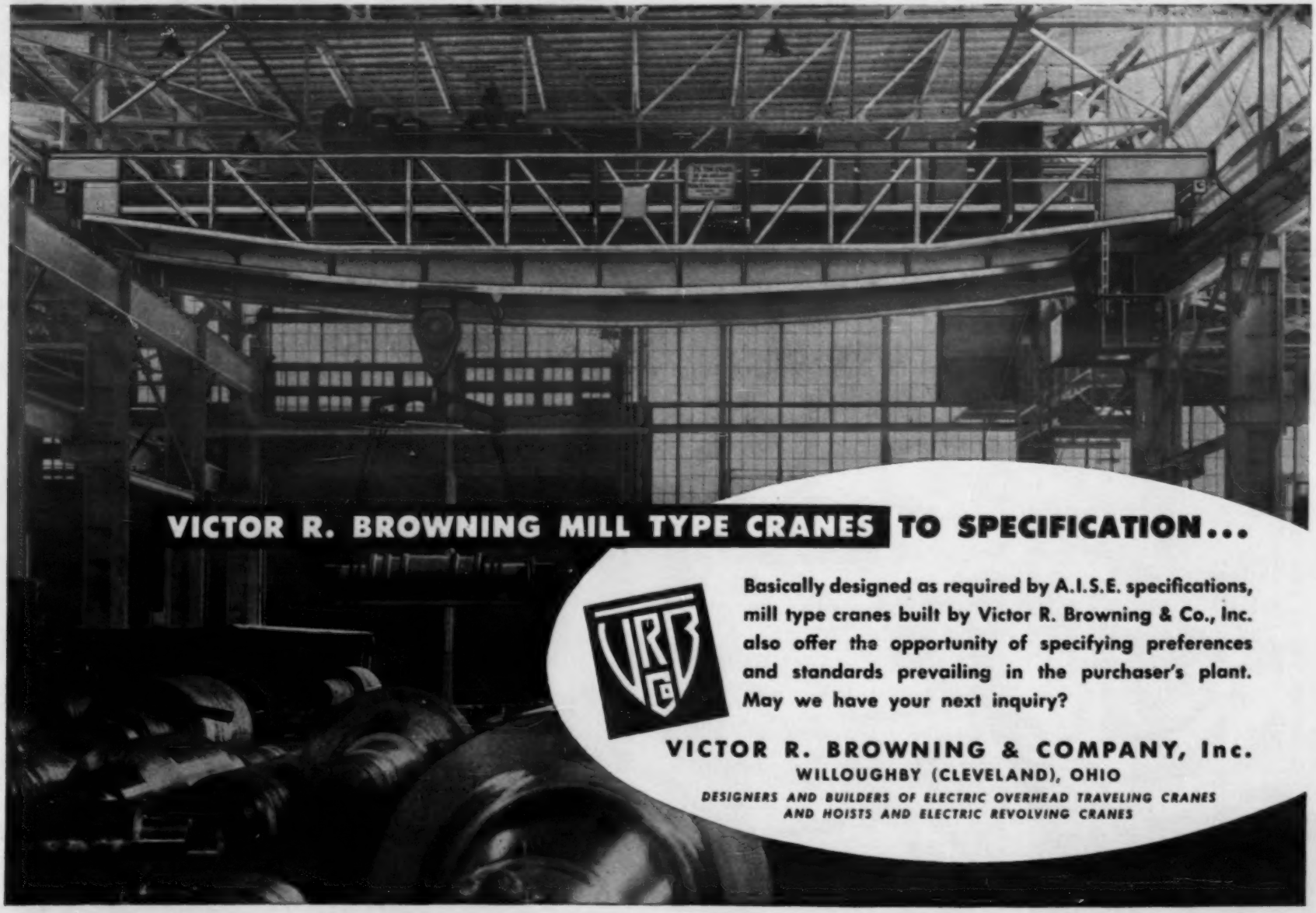
Millions of feet of easily-erected Fenestra roof ribbing have been handled rapidly and accurately on Kane & Roach machines. Nominally rolled from 18 gauge coiled stock the machine forms both plain and perforated sheets. A flying cut off is employed at the discharge end permitting continuous operation of machine in cutting lengths to meet customers' specifications.

Write or wire us today. Our production-tailored engineering can help you cut costs and up production in your plant.

Kane & Roach

INCORPORATED

SYRACUSE, NEW YORK • ESTABLISHED 1887



VICTOR R. BROWNING MILL TYPE CRANES TO SPECIFICATION...

Basically designed as required by A.I.S.E. specifications, mill type cranes built by Victor R. Browning & Co., Inc. also offer the opportunity of specifying preferences and standards prevailing in the purchaser's plant. May we have your next inquiry?

VICTOR R. BROWNING & COMPANY, Inc.

WILLOUGHBY (CLEVELAND), OHIO

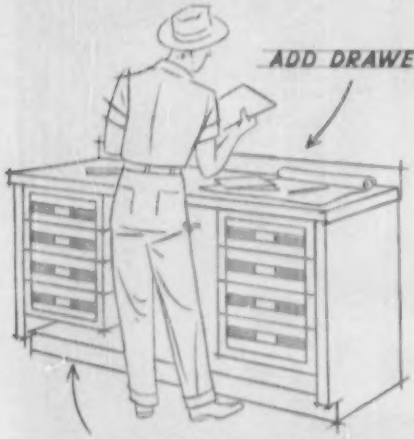
DESIGNERS AND BUILDERS OF ELECTRIC OVERHEAD TRAVELING CRANES AND HOISTS AND ELECTRIC REVOLVING CRANES

HOW TO USE STANDARD HALLOWELL CABINET BENCHES AND ACCESSORIES IN PLANT MODERNIZATION

MODEL 608 - STEEL TOP, STEEL BACK PANEL, BOTTOM SHELF, AND CABINET TYPE BENCH LEGS

ADD TOP SHELF

ADD DRAWER TIERS



ASSEMBLE THEM IN CONTINUOUS LINE

USE THEM AS INDIVIDUAL BENCHES

4 TOP MATERIALS, 3 LENGTHS, 4 WIDTHS
4 HEIGHTS - ALL STANDARD

ADD SLIDING DOORS AND SHELVES

Standard Units · Standard Accessories · Sturdy Steel Construction · Stocked by Leading Shop Equipment Dealers · Send for "Benchery" - a Humorous Booklet on What You Can Do with Hallowell Benches · Hallowell Shop Equipment Division, Standard Pressed Steel Co., Jenkintown 17, Pa.

HALLOWELL SHOP EQUIPMENT DIVISION

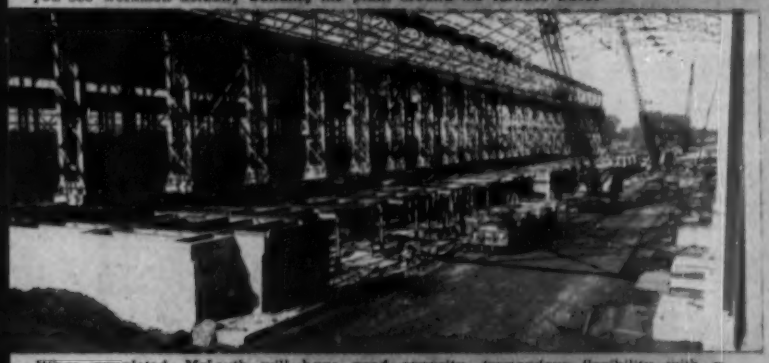
SPS

JENKINTOWN PENNSYLVANIA

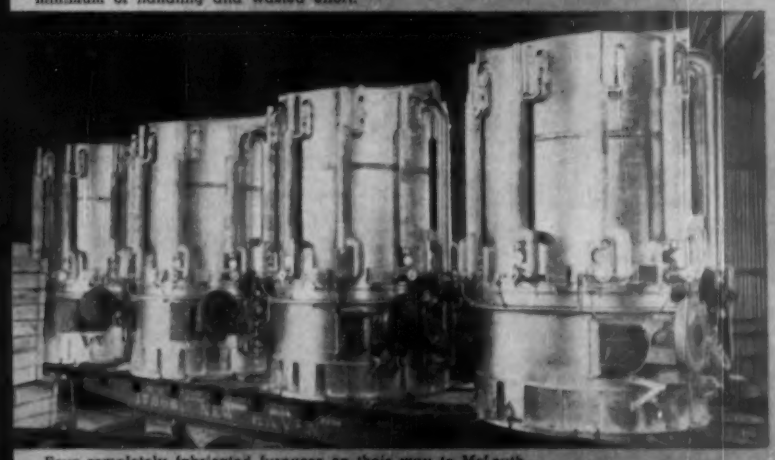
BENCHES (CABINET, WORK, UNIT) • STOOLS AND CHAIRS • SHOP DESKS • TOOL STANDS AND CABINETS • DRAWERS, DRAWER TIERS • STEEL CARTS • SHELVING

YEAR'S LARGEST ANNEALING JOB GOES SINGLE-STACK 100 PERCENT

McLouth's modern annealing department was engineered from the ground up. Here you see workmen actually building the plant around the furnace bases.



When completed, McLouth will have good capacity, tremendous flexibility with a minimum of handling and wasted effort.



Four completely fabricated furnaces on their way to McLouth.

Furnaces in various stages of completion at the Lee Wilson Assembly Plant.

"0" Tube, Portable Base Make LEE WILSON Single-Stacks Fastest Selling Annealing Furnaces In America

McLouth Steel Corporation is nearing completion of an ambitious program of expansion at the Trenton, Michigan, plant that makes its future appear as bright as its stainless steel.

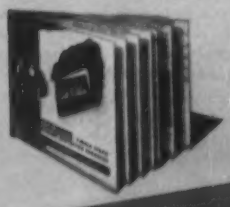
Included in this program is a modern annealing department, consisting of 24 furnaces and 60 bases. The job represented the biggest annealing facility installation for 1954.

After thoroughly checking many makes and types of equipment, McLouth specified the Lee Wilson Single-Stack System, because Wilson engineers gave conclusive evidence, based on existing facilities, that the Single-Stack system would increase production in a reduced floor area, permit far closer control and a more uniform, higher quality product, and, at the same time, have a much greater flexibility of operation.

Each furnace is individually controlled, and each contains 10 high speed "0" tubes that bring the furnace to heat faster, more uniformly, than by any other other method known today.

Let Lee Wilson engineers show you how the advantages of the Single-Stack system will improve your annealing operation—permit you to do a better job, faster at lower costs.

Write for fully illustrated factual brochure.



Lee Wilson

ENGINEERING COMPANY, INC.
CLEVELAND, OHIO

The most widely used high temperature block insulation for over a quarter century...

SUPEREX® high temperature block insulation has long been industry's No. 1 choice for service temperatures up to 1900F. It provides *major* economies . . . reduces fuel costs, cuts heat losses, keeps maintenance expense down, costs less to install and has long service life.

These are the reasons why 90% of the nation's hot blast stoves are Superex insulated . . . and why the low cost open hearth steel producers use Superex in their regenerators.

Made of specially selected and calcined diatomaceous silica blended with other insulating materials and bonded with asbestos fiber, Superex will safely withstand temperatures up to 1900F with negligible shrinkage.

Superex has been used with outstanding success in all types of industrial and metallurgical furnaces and ovens, stationary and marine boilers, auxiliary power plant equipment, regenerators, kilns, roasters, high temperature mains, flues and stacks.

Superex has all these important advantages...

Low thermal conductivity—Exceptionally high heat resistance (1900F) combined with excellent insulating value.

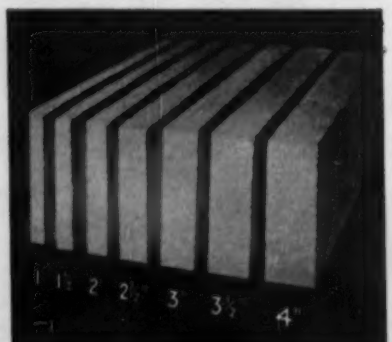
Light weight—Approximately 2 lb per sq ft per in thickness.

Great physical strength—Approximately 6 tons pressure per sq ft are required to compress Superex ½ in.

Long, efficient service life—Superex maintains high insulating value indefinitely—will not disintegrate in the service for which it is recommended.

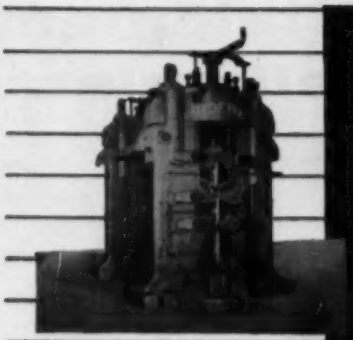
Fast, easy application—Superex may be cut with an ordinary knife or saw for fitting around openings or to irregular surfaces. Because of its light weight and convenient sizes, Superex assures fast and economical installations.

For complete information about Superex block insulation, write for Brochure IN-134A. Address Johns-Manville, Box 60, New York 16, N. Y. In Canada, write 199 Bay Street, Toronto 1, Ontario.



Waste is minimized with Superex because of the variety of thicknesses available. Special shapes and intermediate thicknesses between those shown are also available.

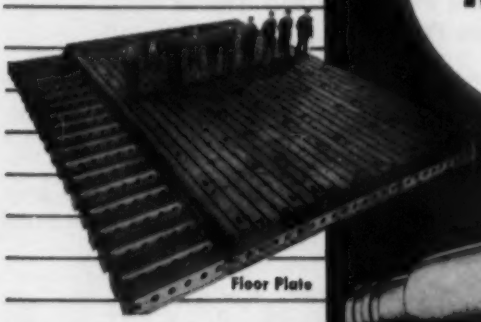
Johns-Manville first in INSULATIONS



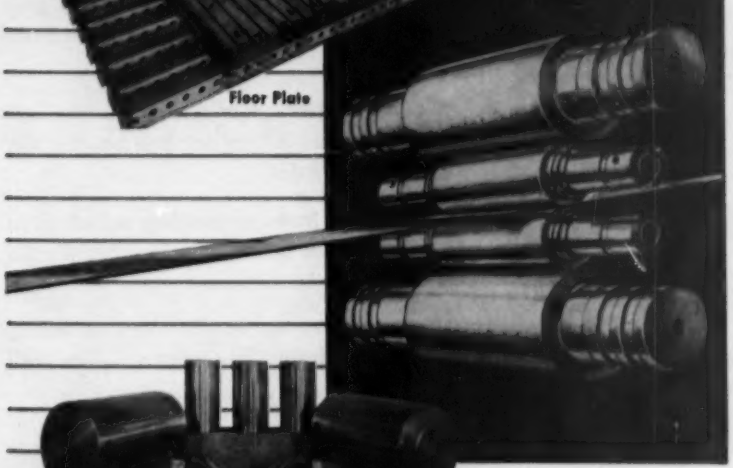
18" 3HI Bar Mill

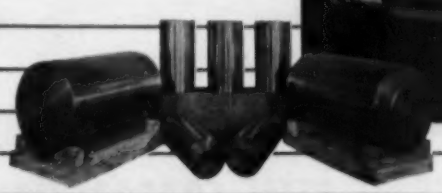
Hyde Park

ROLLS and ROLLING MILL EQUIPMENT



Floor Plate





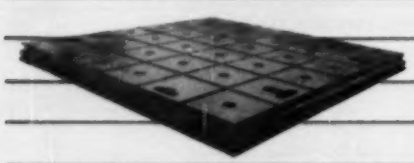
Chilled Iron Hydraulic Rams

The Red circle on the end tells you that the Roll on which it appears is a Hyde Park Roll.

But the Hyde Park Red Circle is more than just an identifying mark; it is our pledge of quality, of performance, of dependability, backed by more than fifty years of experience, of know-how, and of devotion to the highest standards of workmanship.

Call Hyde Park regarding any special rolls and any Rolling Mill Equipment that you require. Our engineers will be glad to assist you.

We make Gray Iron Castings up to 80,000 pounds.



10 ft. x 10 ft. Floor Plate

50" Roll Lathe

RED CIRCLE Rolls ALLOY-CHILLED

Hyde Park FOUNDRY & MACHINE CO.

HYDE PARK, WESTMORELAND COUNTY, PITTSBURGH DISTRICT, PA.

Can we be useful to you?

RELIANCE STEEL

DIV. DETROIT STEEL CORPORATION

Processing and Distributing Plants

CLEVELAND PLANT, CLEVELAND 27, O..VUlcan 3-3600
DETROIT PLANT, DETROIT 28, MICH...WEbster 3-5866
EASTERN PLANT, HAMDEN, CONN.....STate 7-5781
MIDWEST PLANT, CHICAGO 8, ILL.....CAnal 6-2442

Reliance Customer Representative Offices

Dayton, O., Des Moines, Ia., Grand Rapids, Mich., Indianapolis, Ind., Jackson, Mich., Milwaukee, Wis., New York, N. Y., St. Louis, Mo., Toledo, O., Worcester, Mass.

RELIANCE
Job-Fitted
PRODUCTS

COLD ROLLED STRIP STEEL
Coils • Cut Lengths • All Tempers

SHEETS
Cold Rolled • Hot Rolled • H.R. Pickled
Galvanized • Long Terne
Standard or Production Sizes
Sheared or Slit to Actual Working Dimensions

A Frank Statement About Deliveries

The demand for sheet, strip and manufacturers' wire is continuing to put pressure on our schedules. That's why pulling "next week" deliveries out of our hip pockets is not so easy now. As against that we'll do everything our schedules permit to accommodate your more urgent needs.

What it means is that requirements should be anticipated a little further ahead and that delivery promises have to be realistic.

Here's Where We Stand on Delivery Promises

We will not knowingly overbook orders. We never go on the hope that we'll be able to take care of everybody, somehow or other, by hook or by crook.

We won't pyramid promises. That kind of policy can only lead to robbing Peter to pay Paul, and in the long run satisfies no one.

We won't agree to meet delivery requests unless we are reasonably sure we can. We would rather lose your order than chance disappointing you later.

We may sometimes hold back from committing ourselves to the delivery you name. 'Most always, however, we'll make the delivery we promise.

We're not implying that we never, never slip. We are saying that we won't make promises lightly—for your sake as well as our own.

Please call whenever we can be helpful

DETROIT DSC STEEL

DETROIT STEEL CORPORATION

GENERAL SALES OFFICE—DETROIT 9, MICHIGAN

DSC CUSTOMER REPRESENTATIVE OFFICES

Chicago, Cincinnati, Columbus, O., Dayton, O., Detroit, Grand Rapids, Mich., Hamden (New Haven), Conn., Indianapolis, Jackson, Mich., Louisville, Ky., New York, Richmond, Va., St. Louis, Toledo, Worcester, Mass.

DSC MILL PRODUCTS

Hot Rolled and Cold Rolled Sheets
Cold Rolled Carbon Steel Strip Flat Cold Rolled Carbon Spring Steel
Low and Medium Carbon Manufacturers' Wire High Carbon Specialty Wire
Aluminum Cable Strand Reinforcement Rope Wire Tire Bead Wire
Welded Wire Fabric

Copyright 1955 D.S.C.

IN FURTHERANCE OF THE METAL STAMPING INDUSTRY

PMI

METAL STAMPINGS

provide more and better things at less cost — for more people

NATIONAL ASSOCIATION OF METAL STAMPERS, CLEVELAND 20, OHIO

A PROVED EQUATION—

AUTOMATION = McKAY

AUTOMATION—The most thought provoking word in industry today—has almost as many definitions as it has uses. Perhaps the simplest and yet its most accurate description is that "Machines relieve men of tedious and repetitive jobs."

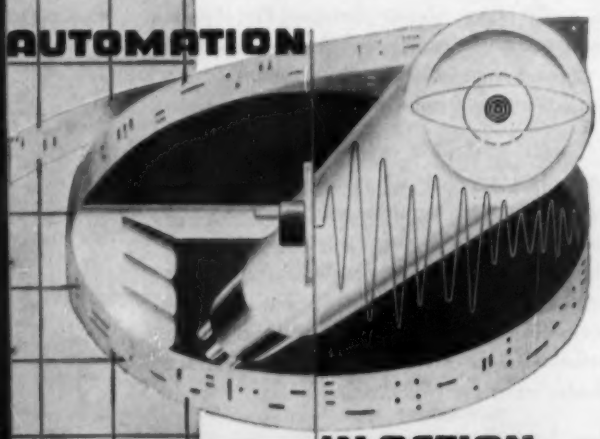
To a great extent, the ever increasing requirements of the automotive industry have been responsible for the steady progress in the design of automatic machines.

Today's radically changing economic conditions resulting in demands for still lower unit costs have been responsible for the accelerated pace in the design of fully "AUTOMATED" automatic machinery.

McKay has for many years been working in close cooperation with the major auto producers, the steel industry and fabricating plants in the development of Automated Machines that automatically take over sequential operations and combine operational functions in preparing and handling raw materials as well as processing and handling finished products.

McKay Engineers have years of actual "on the job" AUTOMATION EXPERIENCE already behind them. To many of their customers, McKay has become synonymous with AUTOMATION. Fully "Automated" press feed lines — cut to length lines — tube and bar drawing lines — welded tube lines and cold roll forming lines designed and built by McKay are considered the finest machines of their type in use today.

AUTOMATION



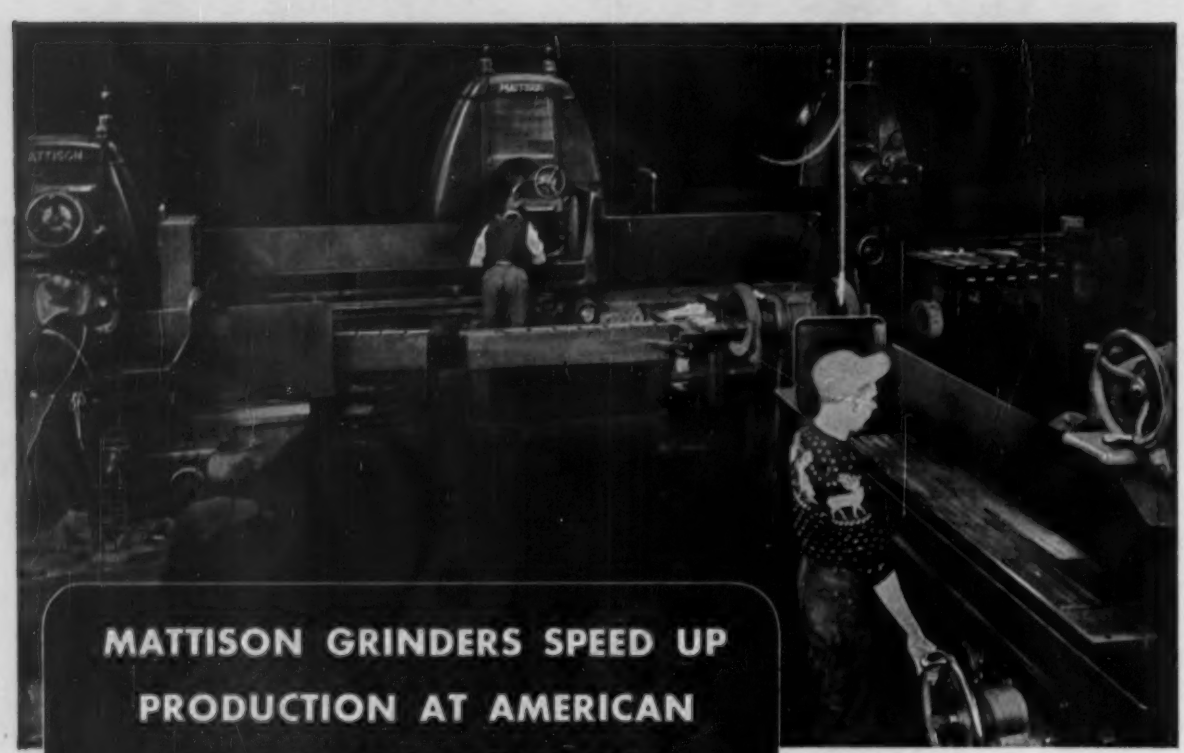
IN ACTION

● The illustration here was designed to exemplify "Automation in Action." It is a composite of a few of the more familiar symbols created by artists to signify this new era of automation. It will be used hereafter to designate truly "automated" machines designed and built by McKay.

The McKAY MACHINE Company
YOUNGSTOWN, OHIO

McK

ENGINEERS AND DESIGNERS OF EQUIPMENT FOR THE AUTOMOTIVE, FABRICATING AND STEEL INDUSTRIES



MATTISON GRINDERS SPEED UP PRODUCTION AT AMERICAN SAW & MFG. COMPANY

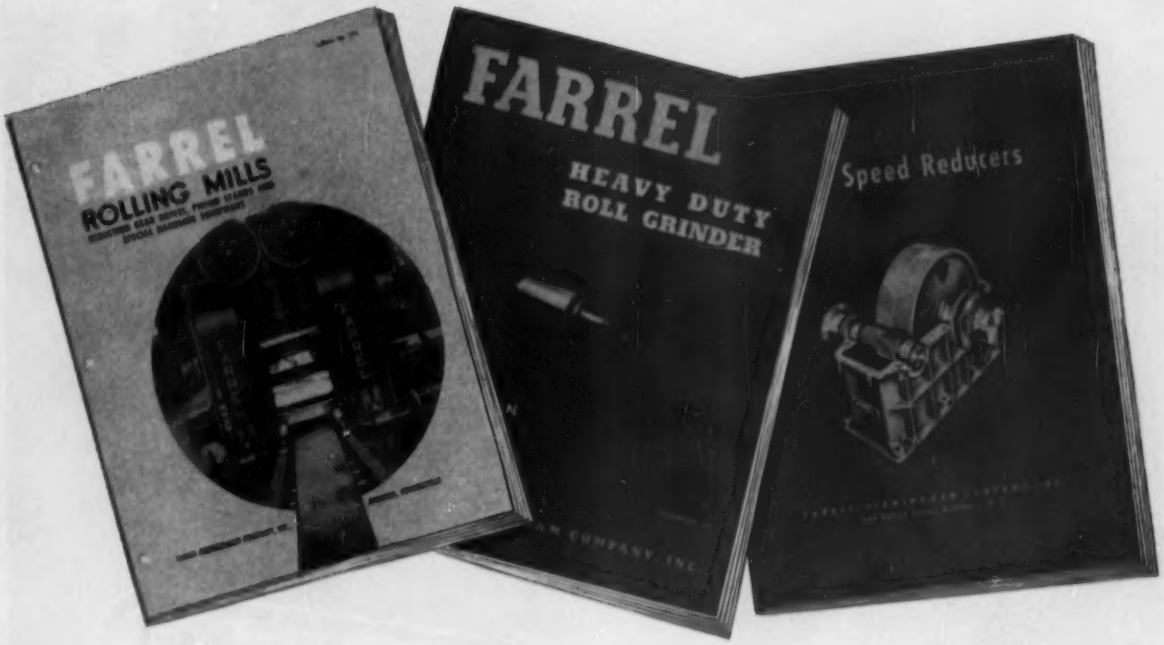
● The four Mattison High Powered Precision Surface Grinders shown above are used by American Saw & Mfg. Company for the grinding of annealed tool steel strips and bars on a real production basis in the manufacture of Lenox Precision-Master Ground Flat Stock. Exacting manufacturing specifications demand excellent finishes within close limits of accuracy.

The massive double column support, high power and rigidity of construction of the Mattison Grinder combine with accuracy and speed of operation to insure consistent precision results on a high production basis for American Saw & Mfg. Company. For complete information regarding the capabilities of the Mattison High Powered Precision Surface Grinder send for free circular.

MATTISON MACHINE WORKS

ROCKFORD · ILLINOIS

108 PAGES OF SOLUTIONS



to rolling mill production problems

Bulletin No. 273 describes Farrel rolling mills, designed and built to individual requirements, in a wide range of types and sizes for rolling nonferrous rods, strips or sheets, metal foils and cold strip steel. It also tells about reduction gear drives and pinion stands, coilers and special handling equipment required to make each installation a complete unit.

Bulletin No. 115 shows in text, photographs and diagrams how the outstanding performance of the Farrel HD roll grinder is achieved. Features described in detail include automatic crowning and concaving device . . . smooth headstock drive by adjustable speed motor . . . vibration-free carriage traverse . . . centralized control of entire grinding operation.

Simple directions for selecting speed reducers of the horsepower and speed you need for auxiliary drives can be found in bulletin No. 449. It also contains specifications, horsepower rating tables, overhung load capacities, dimensions and weights of single and double reduction units.

For a free copy of any of these informative bulletins simply fill in the coupon below.

FARREL-BIRMINGHAM COMPANY, INC.
ANSONIA, CONNECTICUT
Plants: Ansonia and Derby, Conn., Buffalo and Rochester, N.Y.
Sales Offices: Ansonia, Buffalo, New York, Akron, Chicago, Los Angeles, Houston

Farrel-Birmingham®

FB-986
IA

FARREL-BIRMINGHAM COMPANY, INC.
ANSONIA, CONNECTICUT

Please send me a copy of the bulletin checked.

- ☐ Bulletin No. 273, "Farrel Rolling Mills".
- ☐ Bulletin No. 115, "Farrel Heavy Duty Roll Grinder".
- ☐ Bulletin No. 449, "Farrel Speed Reducers".

Name.....

Company.....

Address.....

City.....State.....

To Give Increased Efficiency... to cut costs!

Here's the happy combination—the time-proved features of earlier Type "S" Balancers plus nine great new features which years of production experience have proved desirable. Among these latest improvements are...

- Location of unbalance is by highly efficient, yet inexpensive stroboscopic lamp.
- All electron tubes are standard types, readily available from local sources.
- Dust-tight enclosures are used to eliminate maintenance.
- Controls are of improved industrial and telephone types which operate millions of cycles without maintenance.

If balancing is important in your operations, get the facts about these improved DYNETRIC Type "S" Balancers—available in both horizontal and vertical types for handling parts up to several hundred pounds.

DYNETRIC BALANCERS

GISHOLT MACHINE COMPANY
Madison 10, Wisconsin

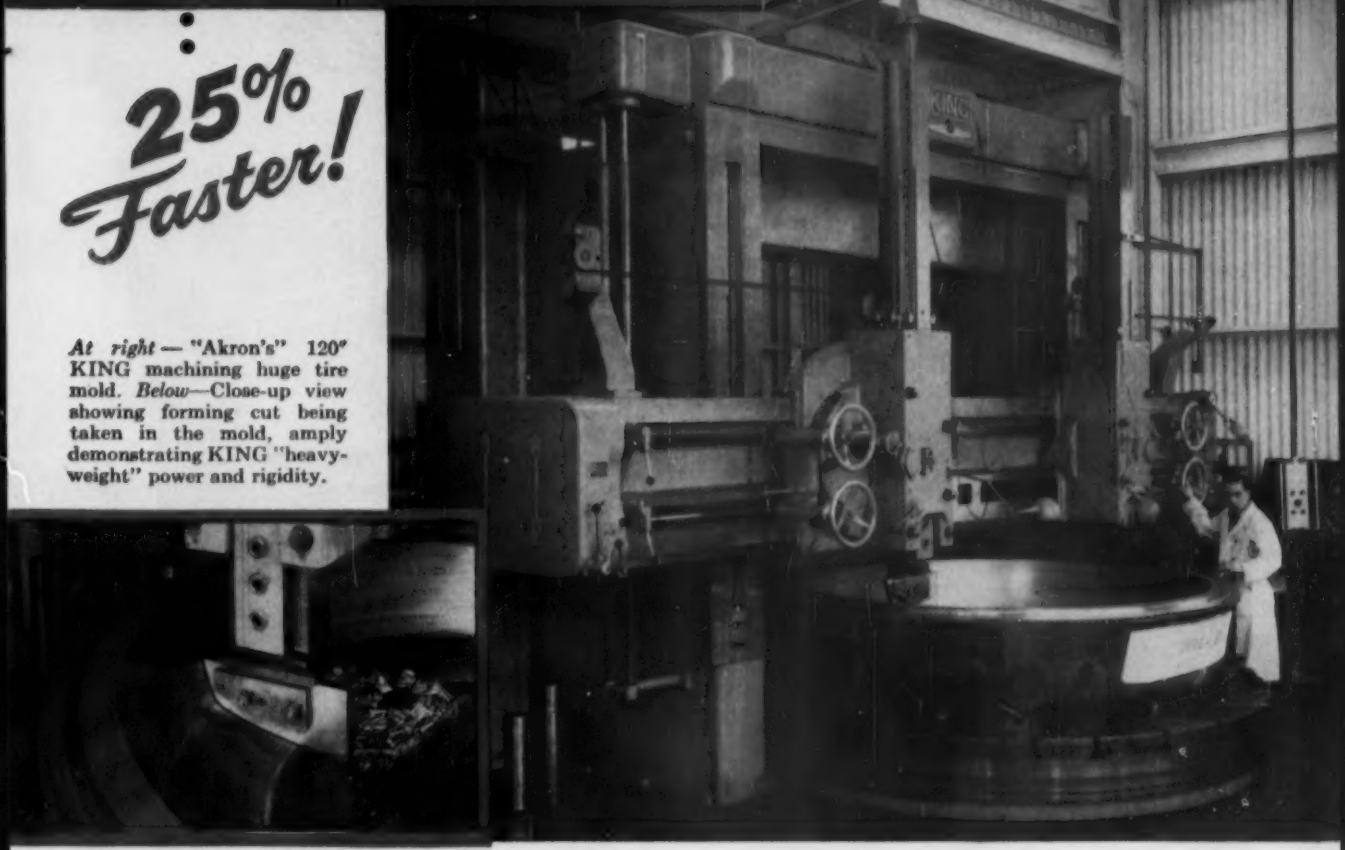
TURRET LATHES · AUTOMATIC LATHES · SUPERFINISHERS · BALANCERS · SPECIAL MACHINES

New KING VERTICAL BORING & TURNING MACHINE

at THE AKRON STANDARD MOLD COMPANY

Machines "KING SIZE" Tire Molds

25% Faster!



At right — "Akron's" 120" KING machining huge tire mold. *Below*—Close-up view showing forming cut being taken in the mold, amply demonstrating KING "heavyweight" power and rigidity.

The Akron Standard Mold Company of Akron, Ohio, a KING® Vertical Boring & Turning Machine customer of long standing, recently purchased the 120" KING shown above for manufacturing giant-size tire molds. The mold being machined is size 30.00 x 33, the largest size mold this company has made to date—so large, in fact, that the forming tool had to be made in three separate pieces in order to complete the contour.

Mr. W. P. Voth, President of The Akron Standard Mold Company, reports this new KING "amply fulfills our requirements . . . and turns out work even faster than we anticipated." Mr. Voth estimates that this new KING has increased production on large size molds by 25%.

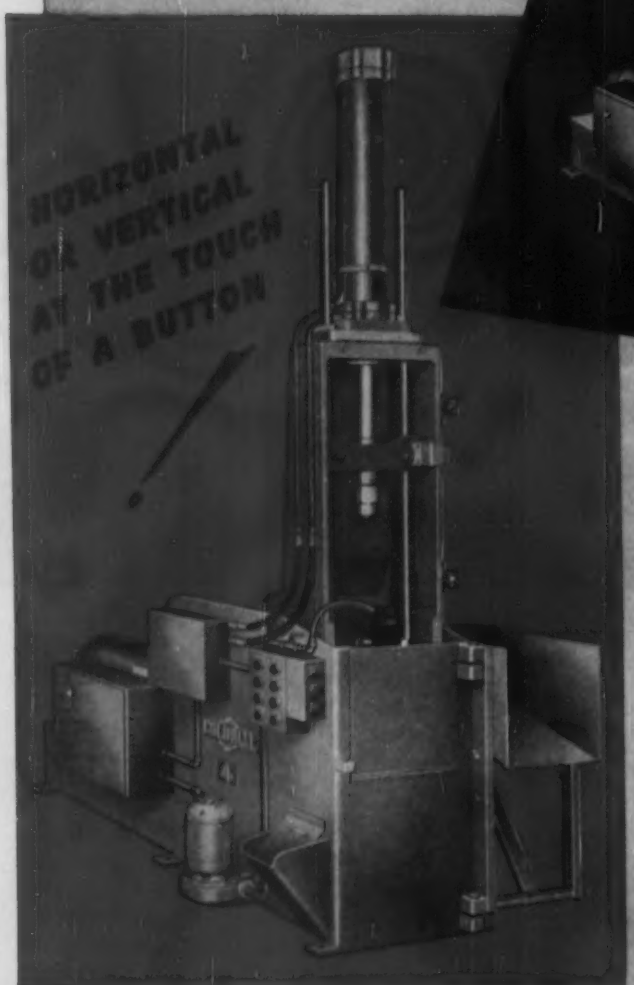
Here is more on-the-job evidence of typical KING performance . . . the kind of evidence that explains why KING today, as in the past, is industry's logical first choice for fast, accurate, profitable production. KING Machines are made in 10 sizes, 30" to 144", in a wide variety of head combinations. See your KING Distributor, or write to us direct, for complete specifications and illustrated description of construction features.

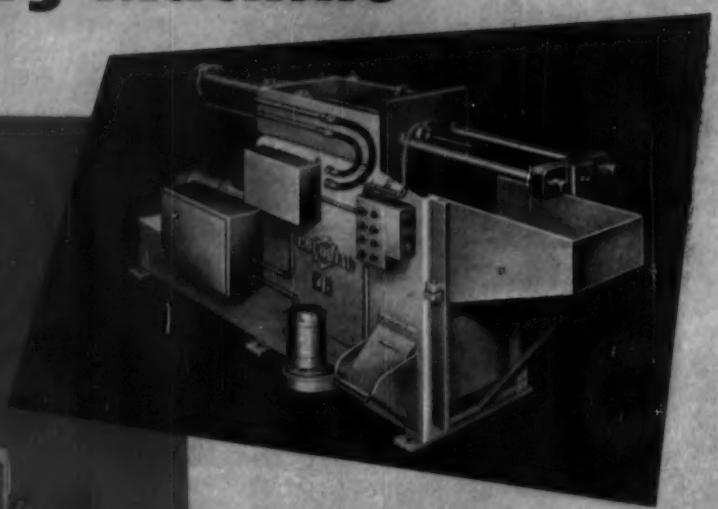
American Steel Foundries

KING MACHINE TOOL DIVISION

1150 TENNESSEE AVENUE CINCINNATI 29, OHIO

Announcing....
the COLONIAL "4" *Convertible* Broaching Machine





This amazing new Colonial "4" broaching machine is the answer for the shop that requires a broaching machine flexible enough to be changed from horizontal to vertical and back in a matter of seconds.

It is truly multi-purpose—performing any of four operations:

1. **Push broaching**
2. **Pull-down broaching** } **vertical position**
3. **Press work**
4. **Pull broaching.....horizontal position**

Rated capacity is six tons for pull-down broaching, push broaching, or press work, and four tons for horizontal pull broaching. Stroke capacity is 28" in horizontal and 24" in vertical position. Guide-bar construction maintains accurate alignment throughout the working stroke for pull-down broaching. Safety interlocks prevent tilting the machine unless the ram is retracted.

Ask for bulletin FW-55 for complete description of the Colonial "4" Convertible.

PIONEERS OF H.S.S. BROACH DESIGN

COLONIAL

BROACH CO. DETROIT 13

1150 TENNESSEE AVENUE CINCINNATI 29, OHIO

STAINLESS STEEL CONTAINING NICKEL resists attack by chemicals and atmospheres over a wide range of concentrations, pressures and temperatures. At elevated temperatures it resists oxidation, yet retains toughness and high strength down to —400°F. Easy to clean and keep clean, chromium-nickel stainless steel is used extensively by Package Machinery Co., of East Longmeadow, Mass., in the manufacture of the bacon packaging machine shown here and other food handling equipment.

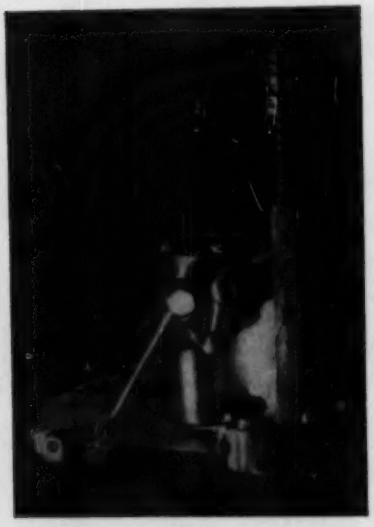
Alloys containing Nickel offer

almost any combination of properties you want

SHOWN HERE are only four of hundreds of different combinations of properties. They give wider play to the skill of the engineer.

You can save weight and provide better durability, and frequently also improve response to fabrication . . . by using appropriate alloys containing nickel. Send details of your metal problems for our suggestions. Write us today.

NICKEL CAST IRONS combine improved strength along with other desired properties such as resistance to heat and wear. The many types available allow you to specify thermal expansion, pressure tightness, machinability and the like. Typical of nickel iron performance, these melting pots cast by C. H. Milles Foundry Company, Chicago, Ill., for use at elevated temperatures, outlasted plain iron pots by 60%.

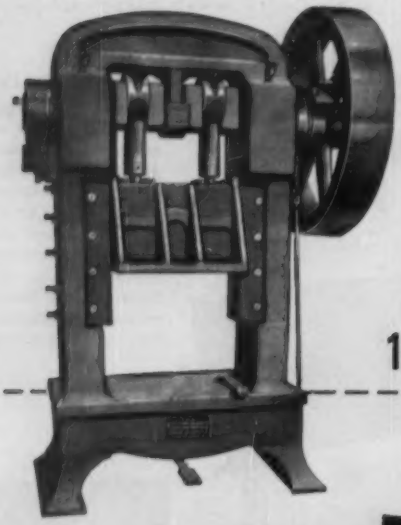


CAST NICKEL SILVER bottle cappers produced by Universal Casting Corp., of Chicago, Ill., are easy to cast or fabricate, machine and polish. This durable alloy combines corrosion resistance and lustrous beauty. Ease of fabrication and maintenance make it ideal to increase product acceptance and cut costs, too.

HERE'S NICKEL STEEL that withstands thousands of impacts per minute. It's a carburized grade used in hammer, anvil and arbor of an Ingersoll-Rand Impactool, shown here, bolting up an assembly. From the many standard grades of nickel alloy steels available, you can readily choose one with the best combination of properties for both fabrication and end use.

EMBLEM OF INCO SERVICE

THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET NEW YORK 5, N. Y.



1880

1955

Cleveland S2-350-84-48 Two Point Press, double geared, equipped with Drum Type Friction Clutch, air brake on flywheel and air counterbalance to slide; capacity—350 tons.

PREPARED FOR THE FUTURE

1955 marks the seventy-fifth anniversary of the founding of The Cleveland Punch and Shear Works Company.

On this our seventy-fifth year we express our sincere appreciation to the customers we have been privileged to serve and who have made possible our continued expansion and growth.

We look to the future with confidence in the knowledge that our many years of close association with the metal working industry have prepared us for greater accomplishments in the years to come. We take this opportunity to rededicate ourselves to ever greater service to our customers by continuously improved machine quality and performance.

After seventy-five years of machine tool progress we are proud of the past and prepared for the future.

AA-656

THE CLEVELAND PUNCH & SHEAR WORKS CO.

Established 1880

POWER PRESSES — FABRICATING TOOLS

E. 40th & St. Clair Avenue, Cleveland 14, Ohio

Offices at: NEW YORK • CHICAGO • DETROIT
PHILADELPHIA • E. LANSING • OXFORD, O.

CITY FOUNDRY DIVISION • SMALL TOOL DEPARTMENT

Sound's great for testing wheels

This is a "sand pattern" produced by the *sound* of a grinding wheel as it is vibrated on CARBORUNDUM's Sonic Comparator. This scientific instrument tests the hardness of wheels for precision grinding. Skilled operators hear—and see on the oscilloscope—the sound...grade with pinpoint accuracy from 250 to 300 wheels per hour. This is just one of many scientific tests applied to grinding wheels by CARBORUNDUM—to make sure you get absolutely uniform production from wheel to wheel. For precision grinding wheels that match the performance of modern grinding machines, it pays to rely on your CARBORUNDUM Distributor or Salesman. He offers expert counsel, complete stocks, prompt service. Call him today.

Through product quality and application "know-how"

CARBORUNDUM

REGISTERED TRADE MARK

continually puts more sense in your abrasive dollar

Hind-side as sandy as fore-side

Use *both* sides of SAND SCREEN for sanding and finishing...do from 7 to 15 times more work with one sheet or disc than you can with conventional coated abrasives. Removed material flows through the open mesh—you sand faster, longer, with much less loading. Use SAND SCREEN wet or dry...for hand or machine finishing. Fold it—tear it to any convenient size. CARBORUNDUM's SAND SCREEN Discs and FASTCUT Pad 85 Assembly slash time and costs on wet sanding of prime coats. On many operations of sanding flats and slight contours, no adhesives are necessary. Cut sheets fit oscillating or vibrating sanders... do a terrific job wherever loading and glazing is a problem. Get samples today from your CARBORUNDUM Distributor or Salesman.

Through product quality and application "know-how"

CARBORUNDUM

REGISTERED TRADE MARK

continually puts more sense in your abrasive dollar

A leading West Coast metal fabricator is helping to make the classical varnished-wood phone booth as obsolete as the hand-crank telephone. Important factor in the redesign of this familiar landmark was the availability of *custom-designed* Harvey Aluminum extrusions, which make up the frame and doors of the new booth.

Booths are now fabricated in fewer steps and can be shipped knocked-down in compact cartons. Installation at the site takes only minutes, with just four screws required for complete assembly. The design blends with the decor of modern stores and lobbies, and, best of all, the completely weatherproof booth can be installed out-of-doors, where wooden booths deteriorated rapidly. Aluminum construction makes roadside phone service practical. Such *double* benefits . . . a product both better to make and better to use . . . follow naturally when you use a Harvey extrusion, *custom-designed* for your product.

The Men of Harvey have a single objective... making aluminum work for *you*. Harvey extrusions are a *custom* product... each is the result of a Harvey Field Engineer sitting down with the customer's designers and jointly planning how the product can be improved with this modern metal form. Our newest brochure "Aluminum Extrusions" is a valuable reference source. We will be glad to send you a copy.

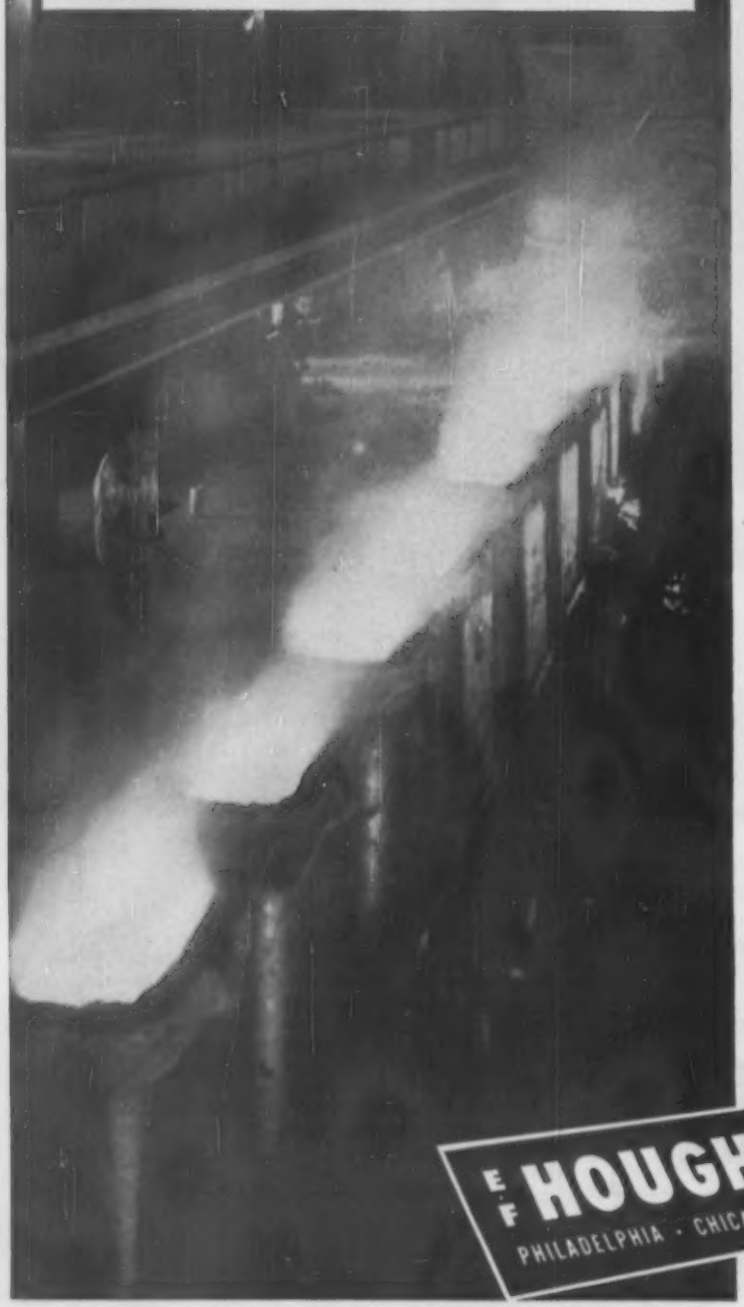
MAKING THE MOST OF ALUMINUM . . . FOR EVERYONE

HARVEY Aluminum

HARVEY ALUMINUM SALES, INC., TORRANCE, CALIFORNIA
BRANCH OFFICES IN PRINCIPAL CITIES

An independent producer of aluminum extrusions in all alloys and all sizes: special extrusions, press forgings, hollow sections, structurals, rod and bar, forging stock, pipe, tubes, impact extrusions, aluminum screw machine products and related products. Also alloy steel and titanium of similar products on application.

How HOUGHTON Helps Produce STEEL



You may know Houghton for its Hydraulic Department, where moulded packings have been made for two generations, and used by practically every steel producer. Current types include leather, synthetic rubber and the new rubber-impregnated leather (VIM 1243) that is taking industry by storm.

Or, you may know Houghton as a maker of specialty lubricants, fortifying petroleum oils and greases to do vastly improved lubrication jobs . . . open gears, hot spots, lube additives for water systems or for fuel oils . . . scores of items for hundreds of specialized applications.

And it is possible that your knowledge of Houghton has been based largely on its metal-working products: rust preventives, heat treating and quenching oils, cutting oils and bases, pickling inhibitors, hot top insulating materials, hot forging agents.

But no matter how you classify this 89-year-young Company, it is certain that Houghton products can be of aid. Behind them is a definite plus value—a field and laboratory service unequalled in our type of industry—also helpful, authoritative publications and manuals highly regarded by metal men.

Get to know Houghton better. Write for bulletin "Houghton Serves the Steel Industry."

E. F. HOUGHTON & CO.
303 W. Lehigh Ave., Phila. 33, Pa.

E. F. HOUGHTON & CO.
PHILADELPHIA · CHICAGO · DETROIT · SAN FRANCISCO

Ready to give you on-the-job service . . .

Heat treating gives LIMAS greater strength and longer service life

In the 1500 degree F. circle, formed by this battery of gas burners, is a shipper shaft pinion destined to become a vital part of a LIMA shovel. This heat, the succeeding water quench and controlled tempering process, establishes a uniform hardness up to two inches in depth to the teeth and teeth base of the pinion. This means longer serviceable life to this important part.

Flame and induction hardening are used on rollers, gears and shafts of every LIMA machine. Heat treating, used with our know-how, is one of the reasons why LIMA is known throughout the world for quality—cost-conscious equipment men everywhere are saying, "you can depend on a LIMA for low maintenance and less down-time."

COMPARE QUALITY! No other machine gives you as much as LIMA!

1. Piston ring type dirt seal rings and retainers in crawler rollers.
2. Moving parts are flame or induction hardened for longer life.
3. Main machinery is placed well back of center of rotation.
4. Anti-friction bearings at every vital bearing point.
5. Big capacity drums and sheaves are easy on cables.
6. Propel and swing gears and power take-off are enclosed in a sealed oil bath.
7. Wherever you are, you can depend on skilled service and nearby warehouse stocks of parts to keep your LIMA on the job continuously.

The above advantages contribute to LIMA'S greater output, less down-time and lower maintenance.

COMPARE and you'll specify LIMA for shovels (¾ yd. to 6 yds.), cranes (to 110 tons) and draglines (variable). Smaller capacities available on rubber.

LIMA Type 34 crane with wheel mounting.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

LIMA SHOVELS · CRANES · DRAGLINES · PULLSHOVELS

BALDWIN-LIMA-HAMILTON

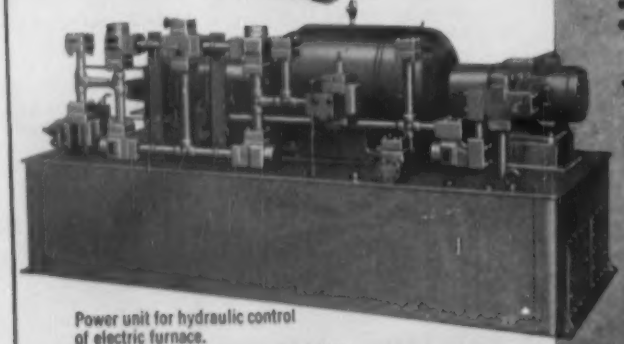
Construction Equipment Division · LIMA · OHIO · U. S. A.

Pulpit type power unit provides full visibility, easy accessibility.

Compact power unit showing gasket-mounted valves.

Portable power unit for testing pumps.

Power unit with gasoline engine as prime mover.



Power unit for hydraulic control of electric furnace.

6837

Individually Designed to Meet *SPECIFIC* Needs

VICKERS®

Custom Built

HYDRAULIC POWER UNITS

DEPENDABLE PERFORMANCE

IMPROVE AND SIMPLIFY DESIGN

REDUCE INSTALLATION COST AND TIME

EASIER SERVICING

BETTER APPEARANCE

Vickers engineers approach the design of a custom-built hydraulic power unit from the standpoint of the customer's INDIVIDUAL needs. The sole objective is to meet HIS requirements with the best hydraulic "package". This assures the most compact, efficient and convenient hydraulic equipment for the particular machine.

A Vickers Hydraulic Power Unit includes all necessary pumps, valves, intermediate piping, oil reservoir, motors, controls, etc., as well as all hydraulic accessories (oil filters, air cleaners, oil level gauges, fittings, etc.). Hydraulic connections can be grouped in a convenient manifold.

In addition to the advantages mentioned above, each Unit is pretested at the factory and ready for immediate operation. Vickers undivided responsibility for the entire hydraulic control system is also an important feature to both the machine builder and his customer. Write for Bulletin 52-45.

VICKERS Incorporated

DIVISION OF THE SPERRY CORPORATION

1420 OAKMAN BLVD. • DETROIT 32, MICH.

Application Engineering Offices: • ATLANTA • CHICAGO AREA (Brookfield) • CINCINNATI • CLEVELAND • DETROIT • HOUSTON • LOS ANGELES AREA (El Segundo) • MINNEAPOLIS NEW YORK AREA (Summit, N. J.) • PHILADELPHIA AREA (Media) • PITTSBURGH AREA (Mt. Lebanon) • ROCHESTER ROCKFORD • SAN FRANCISCO AREA (Berkeley) • SEATTLE ST. LOUIS • TULSA • WASHINGTON • WORCESTER

ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921

For the latest in

FABRICATING EQUIPMENT...

The trend is to THOMAS

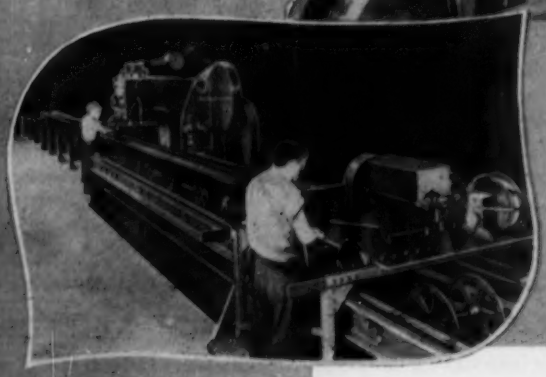
You can rely on Thomas' long years of experience and "know-how" to bring you *first* the very latest in fabricating equipment. Every Thomas unit is *engineered* . . . designed and built with *your* profits in mind.

Practical utility; operating ease and convenience; flexibility, speed and economy . . . these are typical characteristics of Thomas machines. Permit us to quote on your requirements.

THOMAS
MACHINE MANUFACTURING CO.
PITTSBURGH 23, PA.

BILLET SHEARS

An example of Thomas advanced design. These Billet Shears are available in standard capacities from 500 to 2000 tons.

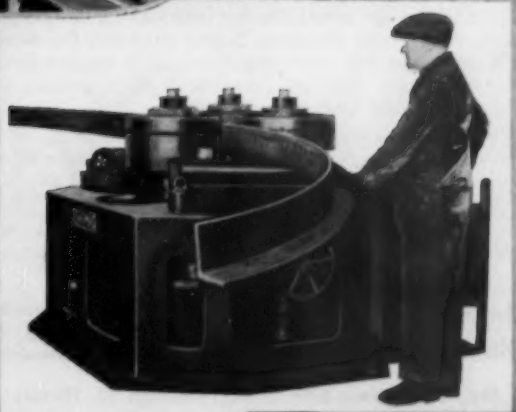


SPACING TABLES

This newest model was designed for the average steel fabricator, where economy and flexibility are so highly important. A worthy companion to the now famous Thomas automatic machine.

ANGLE BENDERS

This Thomas machine makes ordinarily slow and expensive jobs *fast* and *economical*. The all-steel angle roll is built in 4 different sizes and in 2 types.



BAR SHEARS

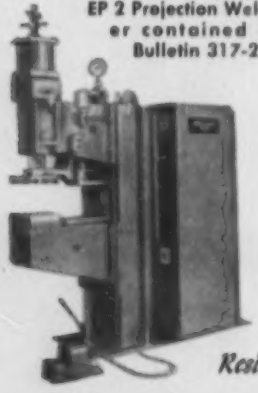
This all-steel machine is offered in capacities of 50 to 400 tons. It may be tooled for various shearing operations or fitted with punching tools.

PUNCHES · SHEARS · PRESSES · BENDERS · SPACING TABLES

Sciaky Type EP 2 Resistance Welder at Berns Mfg. Co., Chicago, Illinois

NEW SCIAKY DESIGN . . . COMPETITIVELY PRICED

Write for complete specifications showing minimum to maximum welding capacities for the standard Sciaky Type EP 2 Projection Welder contained in Bulletin 317-2.



PRODUCTION JUMPS 420% . . .

One Standard Sciaky Welder Does the Work of Four!

With one welder Berns was producing only one-quarter the needed production of 29 piece, 10 gauge wire grills for their nationally known Air King Fan. Instead of selling three more machines, Sciaky provided the newly designed, standard EP 2 Welder equipped with simple tooling to replace the original machine. Production jumped 420% as one machine does the work of four plus, the customer has the original welder for other work.

Write for the complete details of Berns' impressive production increase and equipment savings as well as other similar examples of single welder applications contained in "Resistance Welding at Work", Vol. 4, No. 1.

These typical advantages of Sciaky resistance welding may well be applied to your fabricating operations. Welders designed to do *more useful work* at *lower operating cost* with *maximum reliability* is basic to Sciaky design.

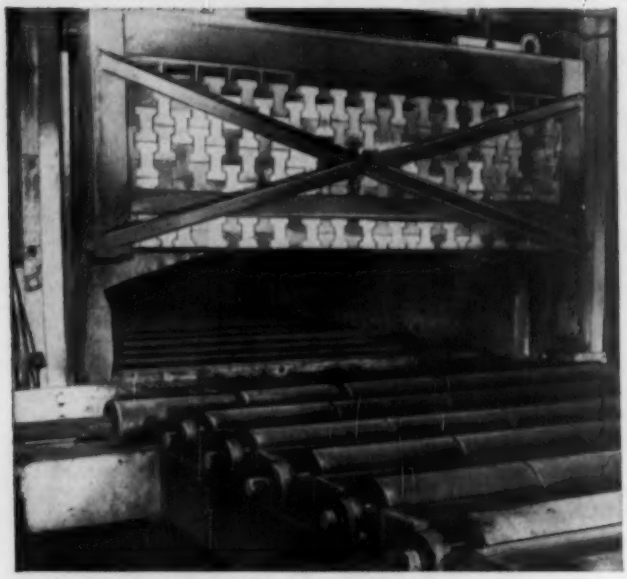
Largest Manufacturers of Electric Resistance Welding Machines in the World

SCIAKY

Sciaky Bros., Inc., 4923 West 67th Street, Chicago 38, Illinois

Lower Maintenance Costs with HAYNES Alloys

Trade-Mark



3800 Hours at 2150 deg. F. —HASTELLOY *Alloy X rollers have been conveying metal sheet through this annealing furnace for 3800 hours. The rollers are subjected to thermal and mechanical shock, 2150 deg. F. temperatures, and exposed to an oxidizing and corrosive atmosphere. They are still in good condition.*

HAYNES Alloys operate efficiently where ordinary metals quickly wear away, corrode, or disintegrate under high-temperatures. They can help you keep production moving and cut maintenance costs.

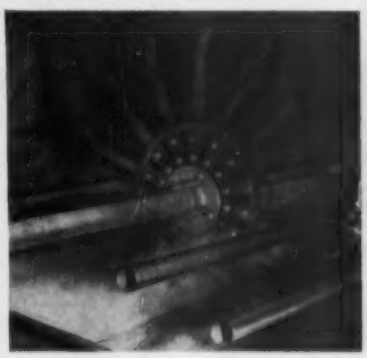
HAYNES Hard-Facing Alloys protect hot shear blades, dies, draw rings, punches, shafts, and other steel mill equipment from the effects of abrasion, heat, and impact.

HASTELLOY Alloys have high strength and remarkable resistance to severe corrosives and thermal shock. Use them to increase the service life of your pickling equipment.

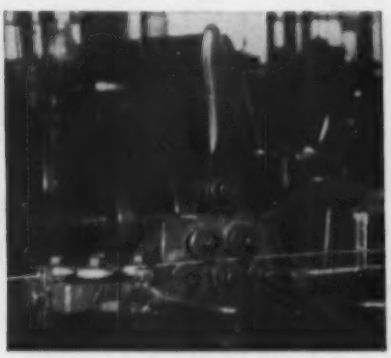
HAYNES High-Temperature Alloys are strong at temperatures up to 1800 deg. F., have high stress to rupture properties, excellent resistance to oxidation, and low creep rate. They give outstanding service in heat-treating furnaces.

For full information on forms, prices, and properties, contact the sales office nearest you.

Guide 200 Tons of Steel —*Entry guides hard-faced with* HAYNES STELLITE *Alloy No. 6 have lasted 4 to 5 times longer than unprotected ones in guiding hot bars. The guides are exposed to abrasion and heat.*



16 to 1 Life in Hot H_2SO_4 —HASTELLOY *Alloy paddles show no loss in cross-section after carrying tubing in and out of a pickling tank for 4 years. Other materials had to be replaced after only 3 months' service.*



10 Years Service —*Wire-straightening rolls cast from* HAYNES STELLITE *Alloy are still in good shape after 10 years' service. Steel rolls, previously used on this job, wore out every three or four months.*

HAYNES
TRADE-MARK
alloys

"Haynes," "Haynes Stellite," and "Hastelloy" are trade-marks of Union Carbide and Carbon Corporation.

Haynes Stellite Company
A Division of
Union Carbide and Carbon Corporation
UCC
General Offices and Works, Kokomo, Indiana
Sales Offices
Chicago — Cleveland — Detroit — Houston
Los Angeles — New York — San Francisco — Tulsa

HOW TO BUY V-BELTS

FOR MORE POWER AND LONGER LIFE

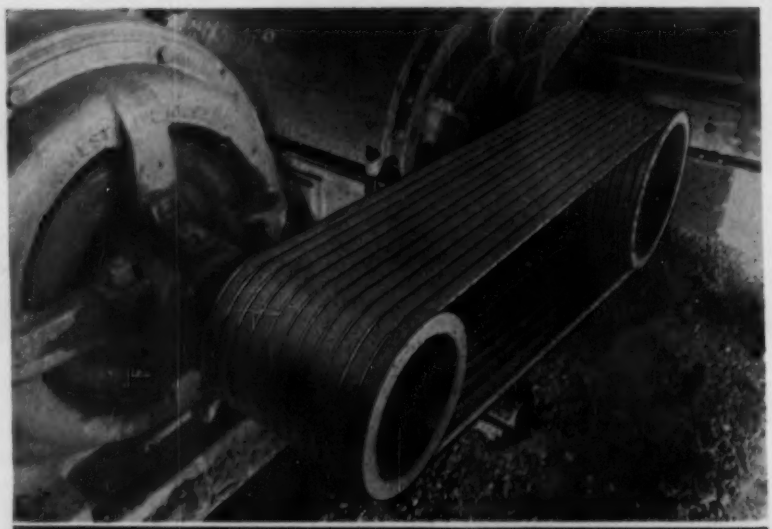
...and get "More Use per Dollar"

Look for a belt with straight sidewalls and accurately positioned strength members that prevent sag in the "power line".

The "power line" or pulling section is the heart of a V-belt. It is here the belt strength members are located and it sets the load-carrying capacity of the drive.

Straight sidewall construction assures firm pressure in the lower or compression section of the V-belt so that when it rounds the pulley it supports the strength member in a straight line. All cords of the strength member should pull equally. If they "sag", as in some constructions, the outer cords are overworked and premature failure results. In addition, straight sidewalls exert a firm side-grip on the sheave grooves, eliminate slip and power waste.

Specify, by name, the V-belt most carefully manufactured so that every part is balanced to deliver full horsepower capacity and "More Use per Dollar" . . . specify R/M Super-Power or standard Condor V-Belts.



R/M SUPER-POWER AND CONDOR V-BELTS

For longer life under shock loads, R/M Super-Power V-Belts have a new synthetic super strength member which delivers up to 40% more horsepower capacity; fewer belts can be used on the same drive for the same horsepower. They are oil-proof, non-spark and heat resistant. Both R/M Super-Power and standard Condor V-Belts have straight sidewalls with strength members micro-positioned and destretched during manufacture. This prevents power waste and frequent shutdown for belt take-up. Let an R/M representative show you why R/M Super-Power or Condor V-Belts last longer . . . give you "More Use per Dollar".

MANHATTAN RUBBER DIVISION—PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.

Other R/M products include: Industrial Rubber • Fan Belts • Radiator Hose • Brake Linings • Brake Blocks • Clutch Facings
Asbestos Textiles • Packings • Engineered Plastic, and Sintered Metal Products • Bowling Balls

"DEEPER DRAWS at LOWER COST with our H·P·M"

"We are very pleased with our H-P-M. For years we felt we could do as well as anyone on depth and severity of draw but H-P-M has certainly broadened our scope in this respect—and at lower costs."

Mr. Ralph F. Mueller
Exec. Vice President
General Metal Products Co.

General Metal Products Reports Broadened Scope and Lower Costs with 700-ton H P M Hydraulic.

Take a tip from one of the midwest's largest metalworking specialists — H-P-M's will reduce costs for you, too. Whether it's drawing, forming, embossing, forging or other operations — large or small, deep or shallow, complex or simple — there's an H-P-M for the job. You'll find more and more work for your H-P-M with its fast cycle, all-hydraulic, automatic control and ease of die set-up. If obsolete equipment is hampering your production, call in the H-P-M field engineer for a close look at the most modern press equipment available. Broaden <u>your</u> scope with faster, more versatile H-P-M's.

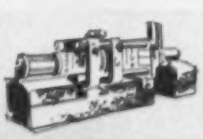
Write today for Bulletin 5005.

HPM

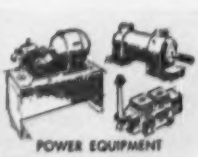
THE HYDRAULIC PRESS MFG. COMPANY
1006 Marion Road, Mount Gilead, Ohio, U. S. A.

METAL WORKING PRESS

PLASTICS MACHINES


DIE CASTING MACHINES

C-PRESSES


POWER EQUIPMENT

OUTSTANDING GEARS

Quality, Service, Delivery

Over 62 years··· PHILLIE GEAR®

Outstanding, because every human and mechanical advantage in Gear making goes into their production: Experienced Designers, Trained Craftsmen, the most Modern Gear Cutting Machines, Up-to-the-minute Heat Treating Processes, Ever-watchful Inspectors, and Careful Shippers—all housed in Modern Buildings, and all under Management who have spent their lifetime in the Gear Business.

Add to these "Phillie Gear's" Courteous Service and Prompt Delivery, and you have a combination hard to beat . . . So, for Gears of any size or quantity, ***consult "Phillie Gear".***

Spur
Helical
Spur Internal
Helical Internal
Rack
Herringbone
Worm
Non-Metallic
Splines
Coniflex Bevel
Spiral Bevel
Zerol
Hypoid
Intermittent
Sprockets

PHILADELPHIA GEAR WORKS, INC.

ERIE AVE. AND G ST., PHILADELPHIA 34, PA.
NEW YORK • PITTSBURGH • CHICAGO • HOUSTON • LYNCHBURG, VA.
Virginia Gear & Machine Corp., Lynchburg, Va.

Industrial Gears & Speed Reducers

LimiTorque Valve Controls

Established 1907

Alliance manipulators

Illustrated here are four standard types

Alliance Builds All Types of Forging Manipulators

All Alliance manipulators are equipped with power grip revolving tongs, main hoist and leveling hoist.

Longitudinal travel for trolley type manipulators.

Longitudinal and transverse travel for bridge type manipulators.

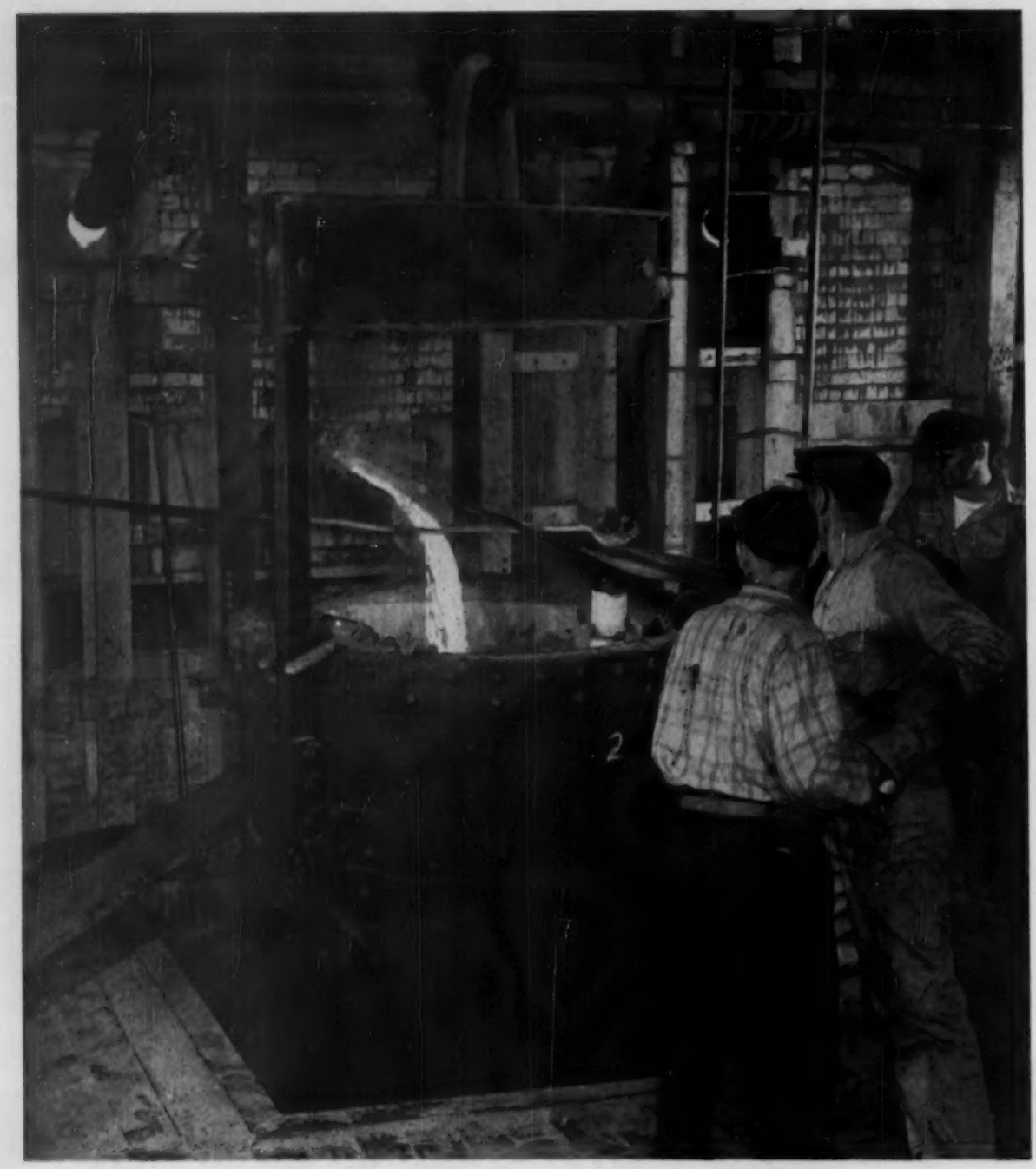
Consult Alliance engineers regarding your forging problems. For more than 50 years The Alliance Machine Company has collaborated with engineers in the design of material handling equipment for all steel mill products.

World's Largest Builder of the World's Largest Cranes

THE Alliance MACHINE COMPANY

Founded 1902 *Main Office, Alliance, Ohio*

LADLE CRANES • GANTRY CRANES • FORGING MANIPULATORS • SOAKING PIT CRANES • STRIPPER CRANES • SLAB AND BILLET CHARGING MACHINES • OPEN HEARTH CHARGING MACHINES • SPECIAL MILL MACHINERY • STRUCTURAL FABRICATION • COKE PUSHERS

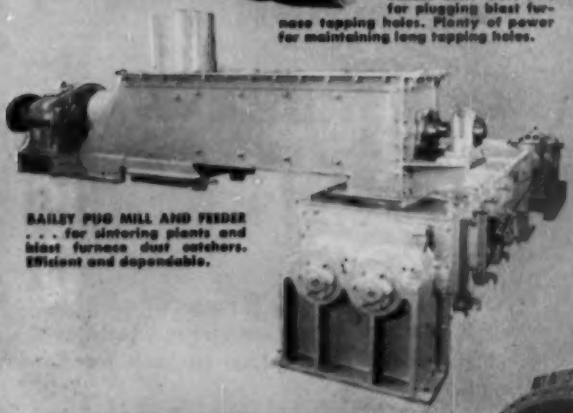


Throughout America, industry improves production, thanks to *GAS*

This is an open hearth furnace, fired by natural gas, at the International Nickel Company. Here, during the initial step in the production of malleable nickel for processing into commercial forms, Gas is used because it economically produces temperatures around 2900°F. Later, Gas works as a production line tool, insuring the bright finish of the metal and softening it in a continuous annealing furnace for further processing. This flexibility, plus its cleanliness, economy, and dependability, makes Gas the satisfactory method of heat processing. That's reason enough for discussing your problem with your Gas Company's industrial specialist.

American Gas Association.

BAILEY CLAY GUN . . . for plugging blast furnace tapping holes. Plenty of power for maintaining long tapping holes.



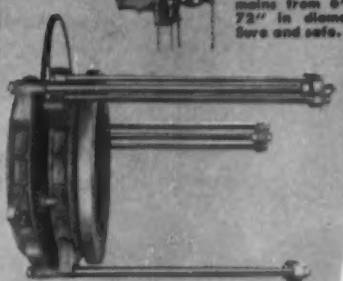
BAILEY PUG MILL AND FEEDER . . . for sintering plants and blast furnace dust catchers. Efficient and dependable.

Bailey EQUIPMENT Does many jobs

. . . EFFICIENTLY
. . . SAFELY . . . and
WITH LESS MAINTENANCE

BAILEY Mechanical GOGGLE VALVE . . . for controlling gas mains from 6" to 72" in diameter. Sure and safe.

BAILEY CINDER NOTCH STOPPER . . . eliminates hazards to workmen at the cinder notch.



BAILEY Thermal Expansion GOGGLE VALVE . . . uses linear expansion and contraction of steel to insure tight seal and quick opening of valves controlling gas mains from 36" to 120".

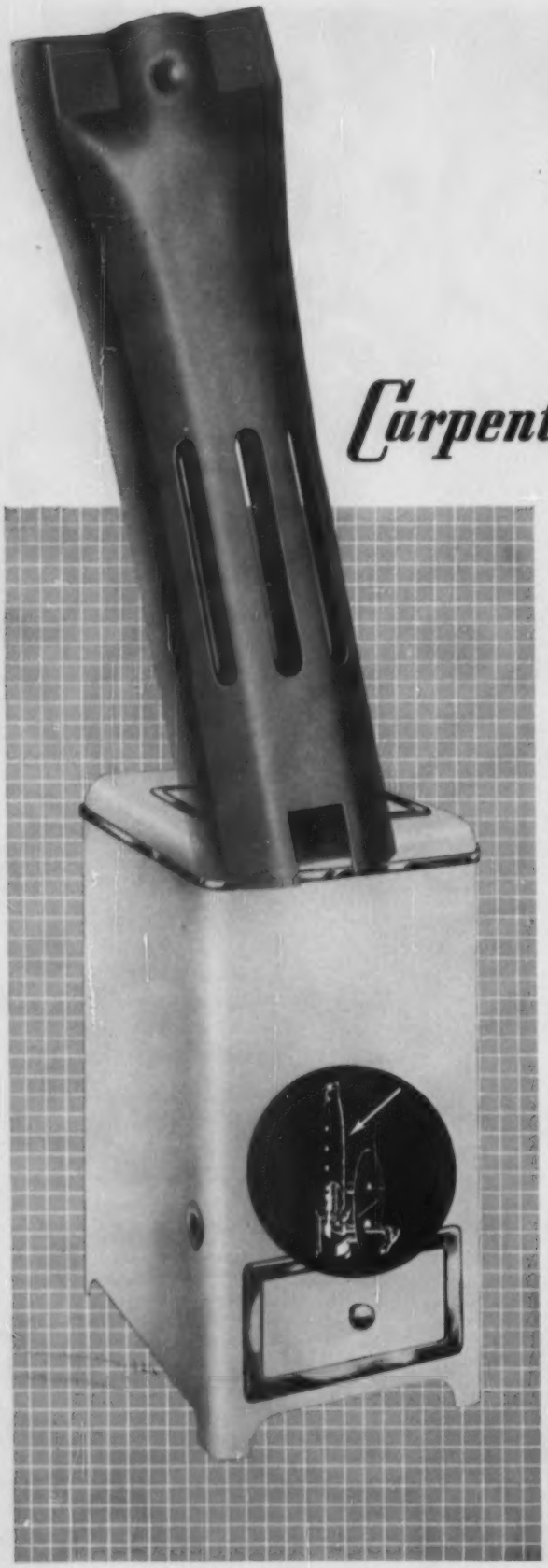
BAILEY PIG CASTING MACHINE . . . for increased casting capacity for foundries and blast furnaces. Sturdy, trouble-free.

Each piece of Bailey Equipment is engineered with two basic ideas in mind—safety under all operating conditions, and highly efficient operation with a minimum of maintenance.

- Thermal Expansion Goggle Valve
- Mechanical Goggle Valve
- Electric Plunger Clay Gun
- Double Shaft Pug Mill
- Sintering Plant Pug Mill
- Cinder Notch Stopper
- Stationary Wheel Pig Casting Machine
- Blast Furnace Cold Blast Valve
- Blast Furnace Blow-Off Valve
- Check and Snort Valve
- Mixing and Check Relief Valve
- Blast Furnace Stove Checker
- Fabricated Steel Stove Bottom
- Regenerative Furnace Checker
- Precision Table Feeder
- Ladle Skulling Hook

Bailey ENGINEERS

1221 BANKSVILLE ROAD PITTSBURGH 16, PA



Design for... Heat and Corrosion Resistance with *Carpenter* Stainless Tubing

When hollow parts you're designing are going to wind up in hot spots—and must also resist attacks of strong corrosives—that's the time to "call for Carpenter" Stainless Tubing.

Here's a case in point. A manufacturer of gas-fired household incinerators puts long-life resistance to organic acids and scaling at temperatures of 1300-1600°F into the burner tubes by making them out of Carpenter Stainless Tubing. As a result, the part is guaranteed for many years of service life. Slotting, forming and other fabricating operations involved in making the parts are easily performed—production costs held down... and Carpenter quality and uniformity make the difference.

There are Carpenter analyses to combat every corrosion condition—defeat even the strongest corrodents—and remain scale-free at high temperatures. What's more, you can be sure of getting the uniform properties, tolerances, finish and quality you need for trouble-free fabrication when you specify Carpenter Stainless Tubing.

It may pay you to discuss your product designs with your nearest Carpenter Tubing Representative or Distributor. A NEW bulletin, "Fabricating and Working Data" is yours for the asking.

MEMBER

The Carpenter Steel Company
Alloy Tube Division, Union, N. J.

Export Dept.: The Carpenter Steel Co., Port Washington, N. Y.—"CARSTEELCO"

Carpenter

Stainless Tubing & Pipe

Weirzin

ELECTROLYTIC ZINC-COATED SHEETS

Cut manufacturing costs!

- Speed production
- Increase die life
- Reduce die maintenance

From the first day you use Weirzin you will find a marked reduction in manufacturing costs. Your production rate will increase with less time spent on die maintenance and replacement. The tight zinc-coating, electrolytically applied to Weirzin steel, actually lubricates dies without leaving a zinc deposit—thereby reducing die maintenance expense and lengthening die life.

One fabricator reported a 300 per cent increase in production per set of dies after changing to Weirzin from ordinary carbon steel. This is an economy factor too great to be ignored.

Add to this the fact that the zinc coating on Weirzin will not flake, peel or powder under the most severe fabricating operations and you will quickly realize what production economies Weirzin has to offer. Write today for further information on how Weirzin can cut your manufacturing costs—and make your product a better one.

WEIRTON STEEL COMPANY

WEIRTON, WEST VIRGINIA

NATIONAL STEEL CORPORATION

STEEL...one piece or a truckload

Delivered where you want it . . . . when you want it

Sure we like big orders—and we handle them easily, every day, because our stocks are the world's largest, our cutting and handling facilities unsurpassed. But our business depends on small orders as well, and you'll find we never lose sight of this fact. Whether you want one bar or a thousand—one sheet or many tons, you'll get courteous service—quick delivery. Dependable, certified quality, too. Call us and see.

JOSEPH T. RYERSON & SON, INC. **RYERSON STEEL**

Principal products in stock: Bars, structurals, plates, sheets, tubing, alloy steel, stainless, re-bars, etc., also machinery & tools

PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CINCINNATI • CLEVELAND • DETROIT • BUFFALO
PITTSBURGH • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

The Iron Age Newsfront

Steel: Estimate '55 Production Up 15 Pct

Estimated steel production in 1955 will be about 15 pct greater than 1954. Look for output of 100 to 105 million tons in 1955, compared with 88.3 million tons in 1954. This means the operating rate will have to average between 80 and 85 pct in 1955 compared with an average of 71 pct in 1954.

Nickel: Availability Concerns Producers

Nickel supply is likely to be a continuing problem of the industry during 1955. Although government controls have been lifted, considerable tonnages are being stockpiled. With stainless and alloy demand on the upgrade, producers are more concerned with the availability of nickel.

Look for Closer Heat Treat Control

The day when the heat treater can control his operations within very close limits simply by turning two dials is not far off—if it is not already here. Substantial progress has been made during the last year toward finding a way to measure gas composition accurately and providing a means of automatic control.

Stainless: Demand to Continue High

This year, 1955, looks good for stainless steel producers. Mills are counting on automotive demand to hold up well during the first half. The chemical and dairy industries should show improvement as well. Appliances and kitchen ware also look good for the coming year. There will be some architectural applications, but no boom.

Tool and Die: Defense Spending Will Help

One of the less bright spots in the 1955 economy is apt to be the tool and die business. Automotive tooling programs will be well below the level of 1954 but defense spending will help.

Rare Earths: Use Trend Continues Up

Rare earths made significant gains during 1954 and things look good for continued interest on the part of steelmakers throughout 1955. Several steel producers are now using rare earths regularly in production of stainless and other high alloy steels. One steel producer is now using them for the production of regular carbon steels.

Induction Heating: Industry Likes It

The trend toward induction heating, particularly in large volume metalworking plants, is increasing rapidly. For many applications plain carbon steel has been substituted for alloy grades. Selective hardening has been readily adapted to many automatic handling setups.

Auto Market: More Even Split In '55

Prosperity in the auto industry will be shared a little more evenly in 1955. Reorganization of merged independents should be completed and Chrysler's comeback for 20 pct of the market seems probable.

See Airlift Ability Tripled by '65

Military air cargo carriers of the future are to be designed specifically to carry materials and will not be intended as part-time passenger planes. With these aircraft, the Air Force expects to raise its cargo airlift capability 50 pct by 1960, at the latest, and to double or triple its present capability by 1965.

Scrap: Brighter Year Ahead

Improved business in the scrap market for 1955 is expected in many quarters. Optimists point to the present high steel operating level, believe this will continue for some time and may go higher. Other signs: Export business is brisk; mill stockpiles are being whittled down; electric furnace operations continue high.

SPECIFY SIRVENE

There are lots of reasons why so many leading machine tool builders agree on Sirvene wipers. You'll find them tops in design, quality and service.

Sirvene wipers are molded as precisely as the setting on a lathe. They must be . . . to exclude fine abrasives and chips, water emulsions or other corrosive materials from bearings. Another reason is their broad resistance to oils, chemicals, solvents, temperatures, abrasion and wear. New metal face and metal cased wipers furnished 22″ long with smudge-free, grey synthetic rubber.

Whether you require wipers of standard or special designs for critical service, investigate Sirvene. You'll find the unmatched experience of C/R Sirvene engineers of great help in meeting your specifications.

GET the basic information on this versatile material. "Engineering with Sirvene" will be sent on request at no charge.

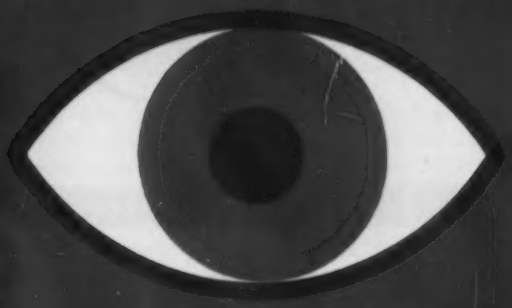
C/R SIRVENE
SCIENTIFICALLY COMPOUNDED ELASTOMERS

CHICAGO RAWHIDE MANUFACTURING COMPANY

1301 Elston Avenue SIRVENE DIVISION Chicago 22, Illinois

Other **C/R** *products*

OIL SEALS: Shaft and end face seals for all types of lubricant retention and dirt exclusion • CONPOR: Controlled porosity mechanical leather packings and other sealing products • SIRVIS: Mechanical leather boots, gaskets, packings and related products.



REVIEW

FORECAST

Business Roundup

Outlook—Metalworking sales will be higher in '55 164
Markets—You'll have to aim true to score well 165
Materials—Few shortages, but watch your inventories 166

Materials and Metals

Iron Ore—Supply will be at second highest level 168
Coal & Coke—Continue research for new markets 169
Scrap—Outlook for 1955 healthier than last year 170
Refractories—Improved steel operations boost sales 171
Metals & Alloys—New alloys developed in 1954 172

Production Processes

Automation—Put cost-cutting philosophy to work 176
Extrusion—Continues to hold industry interest 179
Stamping & Forging—Tie in more automatic devices 180
Machining—Cold forming equipment makes headway 183
Melting—Bright future for vacuum-melted steels 186
Casting—Seek solutions to basic problems 188
Welding—Research comes up with improved equipment 192
Materials Handling—Industry will make solid comeback 194
Metal Finishing—Platers seek substitute compounds 196
Instruments—Potential market strains imagination 199
Powder Metallurgy—New uses promise greater growth 200
Heat Treating—Advances promote high uniform quality 202
Testing & Inspection—Gaging devices pace machines 205

REVIEW FORECAST

BUSINESS ROUNDUP

The economy is shifting back into high gear for 1955 . . . This means you can hit the profit bullseye; but you'll need a rifle, not a shotgun . . . You'll have to watch your inventories to make sure you don't get caught short in the upturn.

◆ YOU CAN HIT the profit bullseye this year. But you'll need a rifle, not a shotgun. The American economy has wound up its shakedown cruise with the largest and most efficient plant in its history. What many businessmen feared was a serious illness turned out to be more economic hypochondria than anything else.

One fact stands out from the experience of 1954: You don't have to operate at 100 pct of capacity to ring up profits. Unless of course you persist in using outmoded equipment, techniques, and—most dangerous of all—ideas.

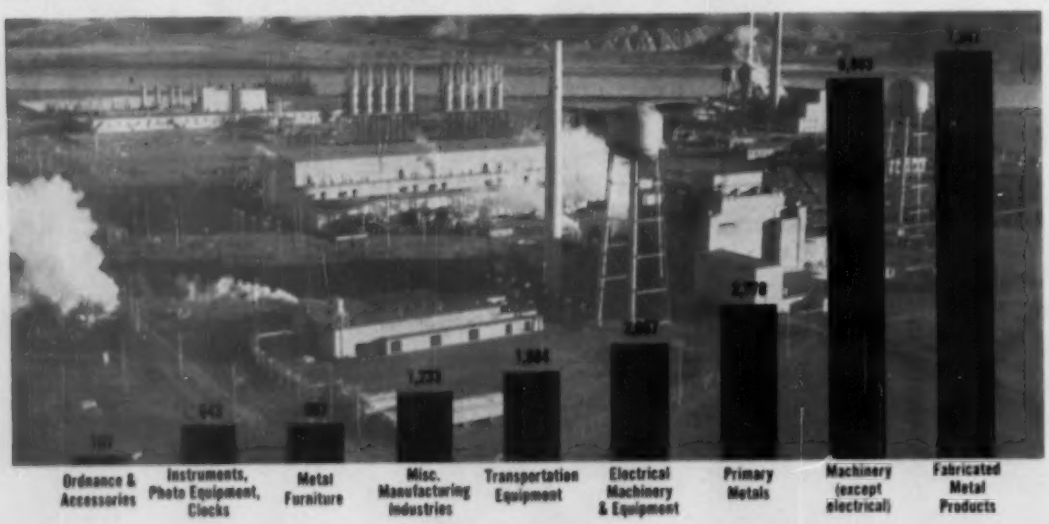
That's where the rifle comes in. Doing business these days is just too expensive to tolerate the old "take a chance, play it by ear" approach. You—and your competition—will be spending a lot of time in 1955 getting the facts—the facts on markets, products, manufacturing, sales, customer likes and dislikes.

And it will be time and money well spent. The American economy will take another giant step in the next 10 years. For the long pull, your business potential is almost unlimited; for the short term, it's still darned good. Here are some of your best sales prospects:

● **Your regular customers** . . . This is more than a seasonal pick-up—it's a shift back into high gear. Both industry and consumers have plenty of money socked away. Corporate working capital and personal savings are at all-time highs. And 1954 showed that hand-to-mouth buying can be expensive.

You know what happened to inventories in 1954: First swollen, then emaciated. They're being built up again now, but buyers are still a little cautious. This isn't a prediction, but paste it in your hat anyway: There could very well be a steel and/or auto strike this spring. Both industries are currently flourishing, and auto

Number of Plants with 20 or more Plant Workers



union contracts are now due for major revision.

With inter-union dissension and rivalry, both United Automobile Workers' Walter Reuther and United Steelworkers' David McDonald may feel that a show of strength will be good strategy. And it will be tough to get one to settle for less than the other. Be sure a strike doesn't catch you with short inventories.

● **Homebuilders and Owners** . . . This field is booming. Some experts believe that construction will go even higher over the next few years. And your markets don't close down when homes are built and finally equipped. New homes mean expanded communities, which in turn mean more stores, schools, service industries and a stepped-up demand for everything from snow shovels to fire engines and electric generators. And don't forget that our population is growing even faster than predicted: about 4.1 million babies in 1954, against a predicted 3.9 million.

● **Defense** . . . Pentagon purchasing started to speed up last June. Fiscal '56, which starts this June, will see higher appropriation requests for defense. The Pentagon likes to keep its unexpended balance big as a cushion in case of a quickie war. If spending remains about the same $35.5 billion rate, defense will need more money so as not to cut too deeply into its reserve. The department figures that Rep. Vinson, D. Ga., new head of the House Armed Services Committee, will join other Democrats and work for a bigger defense budget.

Defense officials have been cagey about confirming it, but watch for these factors to boom military ordering:

1. A new look in arms and equipment, coupled with elimination of obsolete materiel.
2. Creation of new Army divisions. Understrength at first, these will gradually be built up to combat size.
3. Aid to West German rearmament.
4. Continued aid to allies, especially in Asia.

● **Public Works** . . . These will be prodded hard by a three-pronged push: First, the Democrats want to insure full employment, stress "for the people" acts; second, the Republicans want to do the same things; and third, many of these projects just can't wait much longer. Schools, jails and hospitals are seriously overcrowded all over the country; our roads are downright dangerous.

These projects will be major markets at all levels: federal, state and local. And, like housing, in addition to being markets themselves they will bring more new markets in their wake.

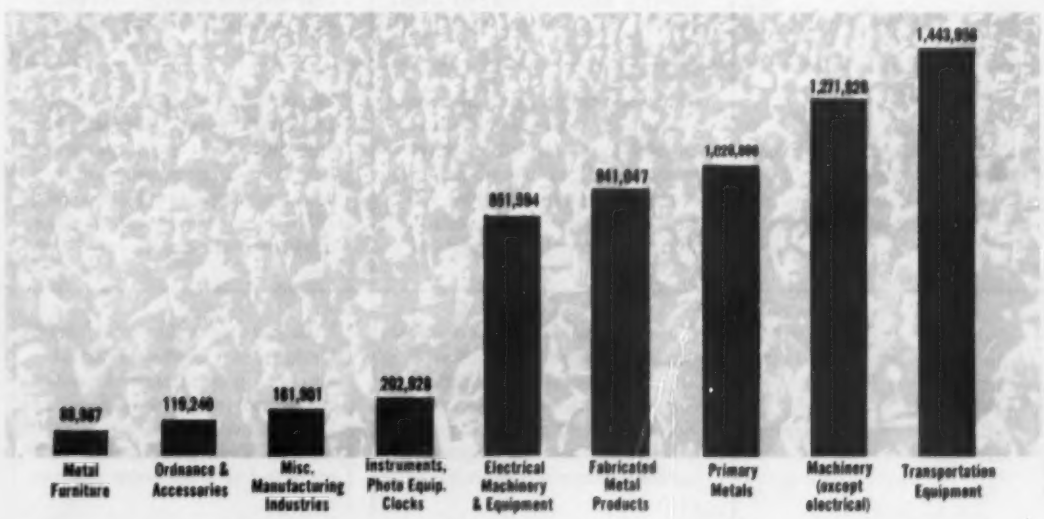
● **Farmers** . . . A combination of rain falling on farms and Democrats descending on Washington means more cash in the farmer's pocket. Farm buying of all types will stay high, with the exception of more or less traditional seasonal declines. And continued mechanization of farms will be reflected in higher sales of more types of equipment.

But farmers buy more than tractors. Farm families are a prime market for consumer durables such as autos, appliances, even private planes. Service industries for rural communities are growing too; frozen food lockers are just one example.

Remember that the farmer wants, often must have, same-day delivery. If you sell to farm communities, be sure your on-the-spot inventories are high enough to service the market properly.

● **Here's how** specific metal markets shape up in terms of supply, demand for 1955:

Number of Plant Workers in Plants with 20 or more



• **Steel** . . . One of the first signs of upturn in the economy showed up in the bellwether steel industry. This is not surprising because the steel market is a sensitive indicator of manufacturing, often forecasting important trends several weeks or even months in advance.

In just 3 months, from mid-August until mid-November, steel production increased by more than 31 pct.

The same inventory factor which pinched the steel industry in 1954 will help it gain more than the economy as a whole in 1955.

While the steel industry produced about 88 million net tons of ingots in 1954, it is estimated that consumption amounted to the equivalent of 95 million tons. The difference of 7 million tons was drawn from inventories.

By the end of the summer inventories were at rock bottom, as low as if there had been a strike. With steel deliveries becoming more extended, many consumers are finding their stocks have been trimmed too short for safety. So they are starting to rebuild inventories.

Inventory replenishment in the first half of 1955 will get an added boost from impending wage talks. The annual wage-price round, with strike or threat of strike, has taught many consumers that steel inventory is better than money in the bank at such a time.

It is not far-fetched to anticipate that as much as 4 million tons of steel may be used to replenish inventories in 1955.

Adding 7 million additional tons which the industry will have to produce to sustain 1954 level of manufacturing, plus 4 million tons inventory replenishment, gives production differential of 11 million tons—due to inventory factor alone.

This places minimum steel production for 1955 at close to 100 million tons, before allowance is made for increased requirements resulting from improved business of steel's customers.

So steel production next year may be anticipated in the range of 100 to 105 million ingot tons, or at about 80 to 85 pct of 1954 rated capacity.

• **Aluminum** . . . The aluminum expansion programs are nearing completion, capacity having been more than doubled since 1950. Aluminum consumers will have no trouble getting all the metal they want next year, but government stockpiling will continue to take any excess off the market. Production may exceed the 1954 record of 1.46 million net tons.

Aluminum pig and ingot prices are firm at higher levels established in midyear. Depending on outcome of wage negotiations, prices may be advanced again about the middle of the year. Prices are pretty well tied to wage and power costs, and both are trending up.

• **Copper** . . . Tight market conditions on copper, resulting from the 1954 strike and some bad guesses by consumers, will ease gradually

	Steel	Aluminum
Supply-Demand	Demand may exceed 100 million net tons (ingots) in 1955. Consumers will face cold-rolled sheet shortage in first part of year. But greatly expanded capacity forbids any lasting shortage.	Consumers will have no trouble getting all they want in '55. Capacity has been more than doubled since 1950. Stockpiling will take any excess off the market. Production may exceed 1954 record.
Price	There will be no general base price changes until the wage question is settled — about midyear. If union wins substantial concessions prices will be raised to compensate. Freight absorption continues.	Pig and ingot prices are firm at higher levels reached in mid-'54. Mill products are less firm. Depending on outcome of wage negotiations in 1955, prices may again be advanced about mid-year.
Trends	Hot and cold extrusion will continue to gain new adherents and new uses. Imports of foreign iron ore and beneficiation of domestic taconite will gain. Vacuum melting and rare earth use will gain.	Look for heavy imports from Canada to continue. More and bigger extruded and forged parts will be produced. Use in diecastings, transportation, building, agriculture is expected to show more gains.

in the first part of '55. But, before that happens, extremely low producer stocks of refined copper, coupled with light consumer inventories, could force a price increase.

Continuing power expansion, and a good year in electronics, autos, building, assure high level of consumption next year.

Look for brass mills to increase their fabrication of aluminum, as they are convinced adopting the competitive metal was a wise move. Duplicate product in either metal would be available.

• **Nickel** . . . will remain in tightest supply of the major metals. Nicaro (Cuba) production, already accounting for 10 pct of Free World supply, will be expanded. So will other Cuban and Canadian facilities. As a result, the metal will gradually move into easier supply.

Regular prices will remain firm. Consumers will continue to rely on overseas nickel to augment supplies, but there is no prospect of return of fantastic gray market such as we had in 1953.

• **Lead & Zinc** . . . Supplies will be ample in 1955. Supplementary stockpiling will continue to hold up markets—at least through the first half.

Another good year of auto production will help lead battery and zinc diecasting markets. Continuing high demand for galvanized steel will continue to support zinc. Heaviest demand will be on continuous galvanizing lines.

• **Labor** . . . No appraisal of metal market conditions can be of much value unless the labor factor is considered. Bargaining over the annual wage round has direct significance on costs and prices of producers, inventories and buying policies of consumers, and availability of supplies.

Labor did all right for itself in 1954, and the healthier tone of a rising economy will strengthen its bargaining hand in '55.

Once again the United Steelworkers and the United Automobile Workers will spearhead the wage drives. The wage pattern for 1955 will be hammered out during the bargaining months of May and June.

Here's what unions will go after hardest:

Steelworkers will drive for (1) a substantial wage increase, and (2) a modified form of guaranteed annual wage. Contract is reopenable only on wages.

Autoworkers are not so limited on what they can bargain for next year. They'll strive to outdo the steelworker aims in addition to broader social insurance benefits paid entirely by management: and more holidays, longer paid vacations, higher overtime pay; plus more voice in management decisions—automation, for example.

As usual, metalworking plants will be expected to match the pattern.

Copper	Nickel	Lead & Zinc
Tight market conditions resulting from the 1954 strike will ease gradually in the first part of '55. Continuing power expansion, and a good year in electronics, autos, building, assure high consumption.	Nickel will remain in tightest supply of major metals. Revived Nicaro production now accounting for 10 pct of Free World output. Nicaro and other Cuban, Canadian facilities will be expanded.	Consumers will have no trouble filling their needs in 1955. Supplementary stockpiling will continue to hold up markets—at least through the first half. Tariff, no longer political hot potato, will hold.
Producers will try to hold current price level. But low producer stocks of refined copper, coupled with light consumer inventories, could force a price increase. Mill products will be competitive.	Regular prices will remain firm. Consumers will continue to rely on overseas nickel to augment supplies. But there is no prospect of return of fantastic gray markets such as we had during 1953.	Prices won't slip much below current levels as long as government buying continues. A rise in zinc might follow decline in smelters' stocks. Lead looks more stable. Market may ease in second half.
Brass mills will increase their fabrication of aluminum, as they are convinced adopting the competitive metal was a wise move. Duplicate product lines will be available in either of the metals.	Heavy consumption is forcing world-wide search for nickel to continue. It's also forcing mining operations deeper underground. This means the long range price trend is up. Lean alloys will be stressed.	Another good year of auto production will help lead battery and zinc diecasting markets. The high demand for galvanized steel, especially from continuous lines, will contine to support zinc.

REVIEW FORECAST

METALS AND MATERIALS

IRON ORE

Iron Ore . . . Coal & Coke . . . Scrap . . . Refractories . . . Stainless & Alloy Steels . . . Rare Earths . . . Ferroalloys . . . Aluminum . . . Zinc . . . Copper . . . Lead . . . Magnesium . . . Titanium.

◆ THE GREAT inventory adjustment of 1954 extended all the way back to the miners in the Mesabi. But unlike the steel industry their outlook for 1955 is not too much improved.

Total U. S. iron ore consumption in 1954 was about 80 million long tons compared to 122.1 million in 1953.

According to latest available reports, stocks of iron ore at U. S. and Canadian mills and ports representing upwards of 80 pct of U. S. consumption, will be at their second highest level in history at start of the shipping season this May. Best estimates indicated even at high level of steelmaking operations, this will have been whittled to 22 million tons. Last year it was 26.1 million and the Great Lakes shippers had their poorest season in 15 years.

Lake ore shipments sagged

Great Lakes shippers had expected to move about 85 million tons in 1954, 10 million short of the record 1953 haul. But at year's end, latest available figures indicated it had hit only about 60.6 million with some layups beginning as early as July.

The most startling development of 1954 from the iron ore standpoint was approval of the St. Lawrence seaway. Subsequent information that it may be completed in five years launched a series of research projects and speculation on its impact on Great Lakes harbors.

Additional major developments were large scale development of Venezuela, Peru, Liberian, Peruvian and Chilean ores with some high grade material also coming from Sweden. As of August, latest figures available, Venezuela led exporters to the U. S. at over 3 million tons.

The four other major exporters, Peru, Canada, Chile and Sweden were all bunched between 1.4 million and 1.1 million tons. The first shipment of Cerro Bolivar ore arrived at Fairless Works in January, heralding a major era in foreign ores. This year shipments from Cerro Bolivar are expected to hit about 5 million tons.

The biggest development in domestic ores has, of course, been reduction of taconite plants on the Mesabi. Reserves there are adequate for 100 years. Biggest operators so far have been Reserve Mining, jointly owned by Republic and Armco; Erie, owned principally by Bethlehem, Youngstown Sheet and Tube; and Oliver, owned by U. S. Steel. Total investments there will be $1 billion by 1970.

Taconite shipments in 1954 were still less than 1 pct of tonnage moved on the Great Lakes but is expected to increase rapidly. Reserve shipped about 280,000 tons in 1954, which was a 75 pct increase over 1953. This year they expect to ship between 300,000 and 330,000 tons but by 1957 this is expected to reach 4 million tons or better.

Search for new deposits continues

In the Far West, the search for additional iron ore deposits continued in the Vancouver, B. C., area and some in Alaska. A major beneficiation plant was also put in full scale operation in Southern California and major mining overhauls completed in Colorado.

Major technical progress in iron ores was directed at taconite where greatest pressure is being applied from production cost standpoint. The world's largest gyratory crusher currently is being built and new pellet drying ovens were developed this year.

COAL AND COKE

REVIEW ← → FORECAST

◆ COAL and coke research and development continued on a broad front during 1954.

A significant development in coke production for blast furnace use was the upgrading of low-grade coking coals through blending with small amounts of high-grade coals. The resultant coke is said to be of better quality on the average than with high-grade coals alone. Strength characteristics are improved.

Another development related to steel production is the practice of several steel producers of fine-grinding coking coals—as much as 80 to 90 pct sufficiently fine to pass through a ⅛-in. screen. Advantages claimed are improved physical quality, less segregation, and minimizing effect of inert material in the coal.

Coal by pipeline

Movement of coal by pipeline has developed to the point where Pittsburgh Consolidation Coal Co., and Cleveland Electric Co., are considering financing a commercial line to run from Pitt-Consol's Georgetown, O., mine to Cleveland Electric's Laketon plant, a distance of 110 miles.

A demonstration line built by Pitt-Consol at Georgetown has been checked out by an outside engineering firm and found to be commercially feasible. The State of Ohio has granted the right of eminent domain to coal pipelines. Water is used to move the coal.

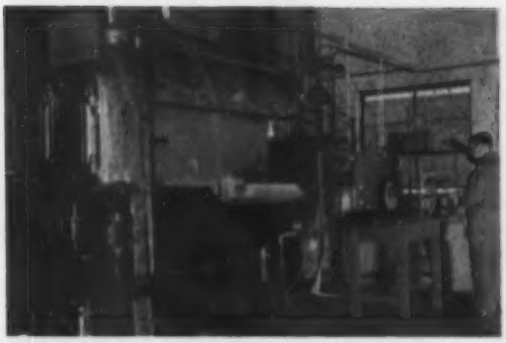
The coal-by-pipeline idea has considerable potential. Already in the "think" stage is a 300-mile project that would carry coal from West Virginia to the Eastern seaboard. Moving coal in this manner overcomes one of the industry's problems—high freight rates.

Low temperature carbonization

Work continued on low temperature carbonization of coal whereby coal chemicals would be taken from the coal and the resultant char sold as a boiler house fuel. This would give the coal companies a higher profit return on their product.

Bituminous Coal Research, Inc., financed by nearly 300 coal companies, railroads, equipment manufacturers, and coal users, carried on research and development work in many phases of coal production, utilization, and marketing.

The coal-fired gas turbine, developed under



EXPERIMENT at Bituminous Coal Research, Inc., tests applicability of bituminous coal to a jet burner already successful on anthracite.

BCR's Locomotive Development Program, has operated successfully on coal for hundreds of hours; BCR is experimenting with an automatic steam generator to compete with "package-type" oil burners for commercial and small industrial applications; it is trying to adapt to bituminous coal the E.F.M. Fire-Jet burner, which has worked successfully on anthracite. This would help soft coal compete in the low-pressure heating field.

Slow coal market

The 1954 coal market was slow for several reasons: (1) competition from oil and gas, (2) imports of cheap Venezuela residual fuel, and (3) reduced consumption generally, notably in steel, which will have consumed 90 million tons compared with 119 million last year. Inventory reduction was another factor. Tough competition brought price-cutting into the picture. Even John L. Lewis laid low in the face of economic facts, did not reopen his contracts to bid for higher wages.

Outlook for 1955 is better, Steel and utilities will be consuming more. The export market has improved. Inventory reduction will not be a problem. But the industry will continue its fight to restrict residual fuel imports, reduce freight rates. Some lean years lie ahead before coal comes into its own through industrial expansion and perhaps lessened competition from oil and gas through reduced supply.

SCRAP

◆ IRON and steel scrap dealers and brokers are entering 1955 with considerably higher spirits than a year ago.

By January 1954 the great inventory shakeout had started, the steel ingot rate had begun to slip, and scrap buying and prices were already declining. By mid-March, No. 1 heavy melting steel had slipped to its low point of the year, just a little over $23 per gross ton. And steel mills had come through the winter with ore and scrap inventories still high, pig iron demand declining.

Second quarter upturn in scrap buying and prices was due to at least three major factors: (1) A realization that prices had dropped so far as to dry up supplies; (2) a slight pick-up in the steel ingot rate in May and June; and (3) easing by Commerce Dept. of curbs on scrap exports.

Export impact felt

Exports played an increasingly important role throughout the summer. While their impact was most heavily felt in coastal areas, exports also made themselves felt in the scrap markets of Pittsburgh and Ohio. It's estimated that scrap exports in 1954 ran between 1.1 and 1.2 million tons, against only 271,000 tons in '53.

The steel ingot rate hovered in the low sixties throughout the summer, but scrap steelmaking prices stayed at the $27-$28 range. Fourth quarter rise in steel output boosted No. 1 steel to $34 per gross ton by November, the yearly high.

Faced with a rising ingot rate, steel producers at least temporarily reversed the trend toward higher scrap prices in late November, early December. The mills' tactic was simply to relight idle blast furnaces and start using hot metal.

But if steel rates continue to rise this year, as many expect, there seems little doubt that scrap prices will go still higher. Other factors that could strengthen scrap prices in 1955 are:

(1) Effect of exports on supply; (2) a severe winter; (3) lower inventories both at the mills and in dealer's yards; (4) better than expected steel business; and (5) rising rate of electric furnaces, which use a 100 pct charge.

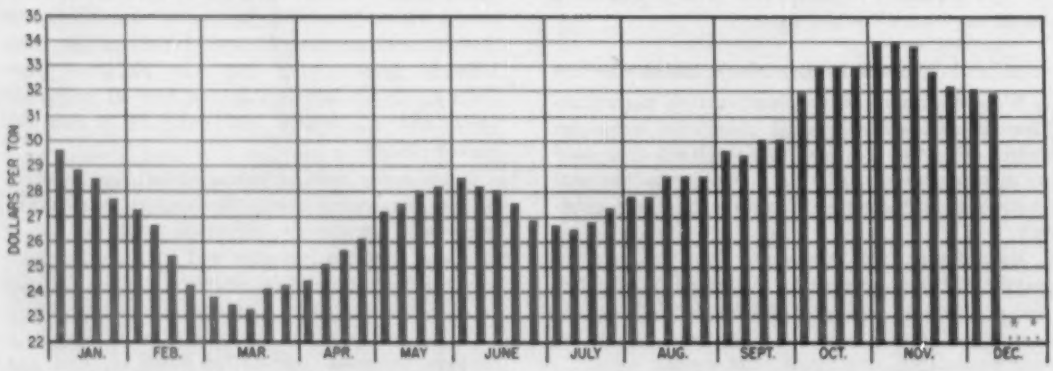
In contrast to the almost unmoving price of primary copper during 1954, copper and brass scrap showed considerable variation. Scrap dealers' No. 1 heavy copper and wire started the year at 23¢ to 23½¢ per lb, dipped to 22¢ in January and then exhibited a more or less steady rise to a peak of 26¢ to 26½¢ during the shortage caused by third quarter labor trouble.

Custom smelter and ingot maker buying prices for No. 1 copper were 6½¢ per lb lower than the primary copper price early in the year. This spread declined in fits and starts throughout the year with one peak in mid-October only 1½¢ per lb less than new copper. This was followed by a slight dip in scrap, then a rebound in December which brought ingot maker buying prices to 29¢—only 1¢ less than prices new copper quotations.

Following a dip in January, aluminum scrap edged upward during the rest of 1954. Long periods of stability were shown.

Other nonferrous scrap prices pretty much followed the trends set by the primary metals, gradually increasing in the case of lead, tin and zinc. Nickel scrap prices eased somewhat as supplies loosened but remained at a high level.

The Iron Age No. 1 Heavy Melting Steel Scrap Composite Price in 1954



* Dec. 21 & 28 prices, $32.83.

REFRACTORIES

REVIEW → FORECAST

◆ OUTCOME of an experiment by U. S. Steel Corp. indicates that application of carbon refractories to blast furnaces probably will continue to be limited to bottoms and hearth, possibly as high as the bosh.

In its experiment at Gary Works, U. S. Steel lined its No. 10 furnace from bottom of the stove coolers to 35 ft above the mantle, with carbon refractories. When the experiment was halted after a relatively short period, it was found that the lining had deteriorated seriously under alkali attack.

U. S. Steel last October lined two furnaces with carbon boshes, one with petroleum coke base, the other with an anthracite base.

The second all-basic open hearth in the U. S. was put into production late in 1954 at Keystone Steel & Wire Co. plant in Peoria, Ill. The furnace has a flat suspended roof of Dietrich design. Only other all-basic open hearth has been in operation 7 years at the South Chicago Works of U. S. Steel.

Basic checker brick

An all-basic furnace permits operation at higher temperatures with a resultant 15-20 pct increase in production. The chief drawback in comparison with a silica roof is price—a ratio of 3.5-4 to 1 on an installed basis in favor of silica.

Two steel plants are experimenting with basic checker brick in the open hearth. The companies laid the top five courses of the setting with basic brick to determine whether increase in service life will warrant additional cost. Checkers have been subject to increasingly severe service conditions due to increases in pre-heating temperatures.

A chemically-bonded silica brick is being manufactured by a Mid Western refractories company but the product is still in the development stage.

RELINING blast furnace. Armco Steel photo.

Trend toward castables

The trend toward castables and plastic fire brick in soaking pits and heating furnaces continued during the year. Plastic fire brick is being used experimentally in hot top linings.

Another trend that gained momentum is that toward use of more high purity silica brick.

With the refractories market more competitive, consumers were insisting upon better quality, particularly for blast furnace linings and stoves. Checker brick for open hearths and blast furnaces also were being subject to close inspection for quality.

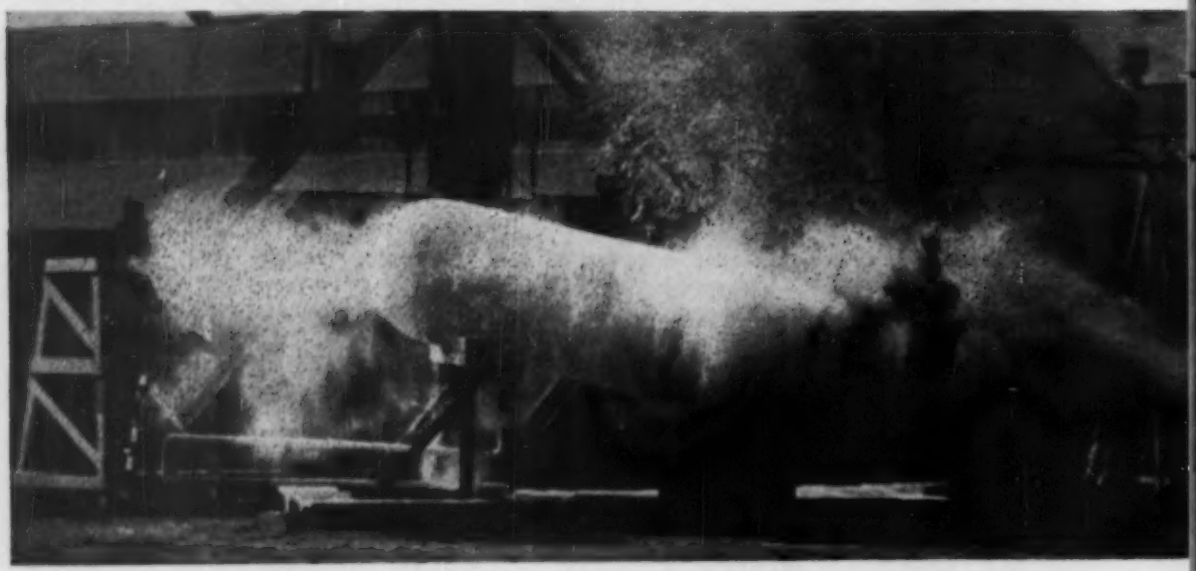
In the market place, refractories producers had their problems and their reasons to cheer. The year was highly competitive to the point where some small and medium-size producers resorted to price-cutting to increase their share of the business.[1] Sales and earnings in the first three quarters were off sharply from 1953. But as the year ended, business had picked up and the bugaboo of inventory reduction had just about run its course. Industry leaders were looking for better times during 1954, due chiefly to improved operations by their biggest customer, the steel industry.

In the foundry, considerable interest was aroused by the application of basic linings to cupolas.[2] The Black-Clawson Co., of Hamilton, O., has standardized on the basic melting practice. Advantages over the acid lining, according to this company, include (1) less refractory consumption per ton of metal melted; (2) lower sulfur contents and higher manganese recovery; (3) permits use of cheaper grades of pig iron and coke, and (4) an all-steel mix may be substituted when scrap iron and pig are in short supply. Lower sulfur content is especially desirable in producing ductile iron, says the company.

THE IRON AGE REFERENCES

1. Refractories: Expect Upturn, Aug. 19, p. 79. 2. Basic Lined Cupola Cuts Costs, Improves Quality, April 29, p. 85.

REVIEW ← → FORECAST



STEEL TEST tank frozen at 45 deg below zero bursts from internal pressure of 2,850 psi. Tank is made of Carilloy T-1 developed last year by U. S. Steel for pressure vessel uses.

METALS AND ALLOYS

◆ PRODUCERS of alloyed steels and alloying agents can look back on progress in 1954 and forward to a continuing succession of new problems tempered by the vision of big rewards.

In the field of stainless and other alloys, the outlook was never better, providing the key to new applications is found.

The potential for precipitation hardening stainless is a prime example. This material, which has the advantage of developing its best properties after thermal treatment and which lacks the directionality of cold worked stainless, is believed to be a better product for heavier and more complicated sections in aircraft applications.

PH stainless already is in use on the leading edges of supersonic aircraft and in "hot spots" around jet engines. Friction-generated temperatures on the skin of planes operating at supersonic speeds require a material of this type. Temperatures up to approximately 500° F are generated, about double the temperature limitations of aluminum in these applications. The aircraft companies are said to be doing much development work with the PH steels.

During the year two new grades of high nitrogen chromium-manganese-nickel steels were developed as substitutes for the 301 and 302 types of chromium-nickel stainless steels. These chromium-manganese-nickel steels are fully austenitic in structure and are designated as 17-4-6 (17 pct cr, 4 pct ni, 6 pct, mn) and 18-5-8 (18 pct cr, 5 pct ni, 8 pct mn) steel.

One of the important features of the new steels is their comparatively high stress to rupture strength at elevated temperatures associated with excellent ductility, toughness and strength both at room and sub-zero temperatures. Detailed results from stress to rupture tests between about 1000 and 1500°F have shown that the steels are as strong under these conditions as the columbium bearing 347 type of 18-8 steel. In addition the steels have a high order of corrosion resistance.

The development work on the chromium-manganese-nickel steels has again demonstrated the strong austenite forming characteristics of the element nitrogen. Currently with the development of the steels, work has been done by the Electro Metallurgical Co. on high nitrogen alloy products to make feasible the commercial introduction of nitrogen into the steels. One of the products is a nitrided electrolytic manganese metal containing about 6 pct nitrogen, and the other is a low-carbon ferrochromium alloy containing about 6 pct nitrogen

with carbon contents usually under 0.025 pct. The nitrogen therefore can be added to the steels simultaneously with the manganese or with the chromium addition or by using both types of products, depending upon production requirements.

Nickel supply is likely to be a continuing problem for the industry. Although Government controls have been lifted, considerable tonnages are being stockpiled. With stainless and alloy demand on the upgrade, producers are becoming more concerned over the availability of nickel. If the nickel situation becomes

The good forming properties of the austenitic stainless steels, plus the ability to be hardened at temperatures low enough to prevent excessive scaling and distortion, are combined in a new stainless steel developed late in the year by Allegheny Ludlum Steel Corp.[1] With the new alloy, AM 350, a desirable combination of high hardness and strength, good impact strength at low temperatures and good corrosion resistance can be achieved by a refrigeration and tempering heat treatment.

Use of a refrigerating treatment, without simultaneous working of the metal to develop strength, constitutes a new approach to the problem of precipitation hardening stainless steels. Use of a refrigerating treatment does not involve precipitation of a second phase. As a result, AM 350 when hardened by sub-zero cooling and tempering is not truly a precipitation hardening stainless steel. It does, however, achieve the same effect as a precipitation hardening steel without the decrease in impact strength and corrosion resistance associated with the precipitation of a second phase in stainless steel.

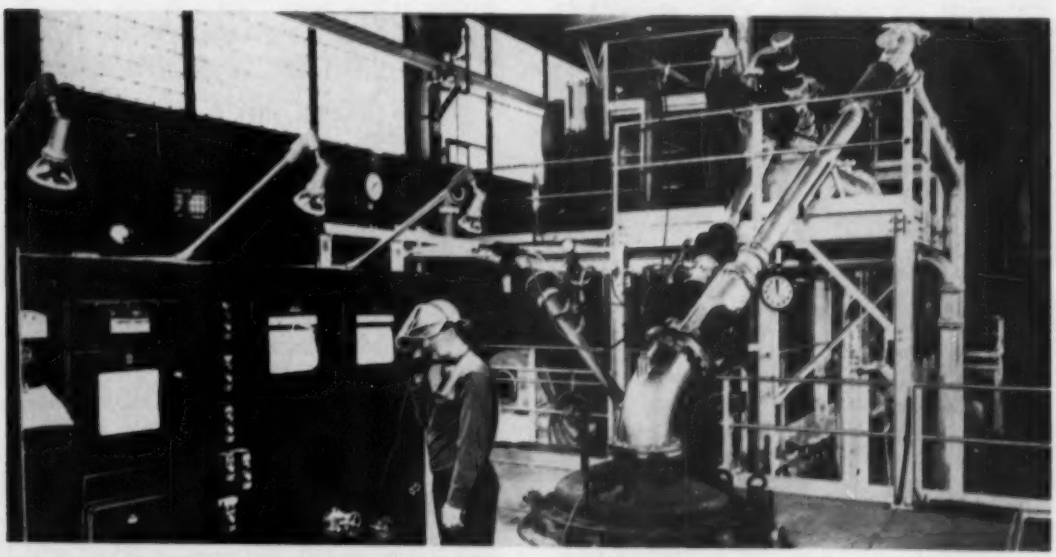
Vacuum melting made more headway during the year.[2] And the emphasis on purity is in turn intensifying demand for high purity alloying agents. Electrolytic chromium is only the first step in this direction. Other ferro alloys of greater purity must be developed. Ferro alloys producers also are under pressure to lower oxygen content. But for the present at least this can be achieved only at extremely high cost.

Hardened carbon bars as a substitute for alloy bars has made considerable progress in automotive applications. But the aircraft companies reportedly have turned thumbs down on grounds that it would be a mistake to downgrade in critical applications.

The Navy is said to be willing to accept hardened armor plate containing no nickel. But this raises the question of whether steel producers can afford to install expensive heat treating equipment for a product in heavy demand only during periods of international crisis or war. Also, there's the matter of possible bottlenecks when demand is extremely heavy.

U. S. Steel Corp. announced and demonstrated its new Carilloy T-1 steel for pressure vessel applications in 1954. The company believes that the quenched and tempered plate is suitable for construction of pressure vessels. It also argues for modification of present requirements for stress relieving as they pertain to toughness.[3]

A new Ce-Mg alloy for treating ductile iron castings and stainless steel ingots was developed. Chief advantage is said to be greater dispersion. Also, developed is a boron-containing ferrosilicon alloy (.03-.05 pct boron, 50 pct ferrosilicon) for cast iron as a means of simpli-



SODIUM reduction of titanium is tested in Niagara Falls pilot plant of Electro Metallurgical Co. The first commercial non-Kroll process plant is now under construction.

Who's Who in Titanium

Titanium Sponge Capacity—Present and Proposed

Company	Plant Location	Present Annual Capacity	Proposed Annual Capacity	Completion Date or Schedule	Production Process
E. I. du Pont de Nemours & Co.	Newport, Del.	3600 tons	3600 tons	Apr. '54	Kroll
Titanium Metals Corp. of America	Henderson, Nev.	3600 tons	3600 tons	Oct. '54	Kroll
Electro Metallurgical Co.	Ashtabula, Ohio	Pilot Plant at Niagara Falls, N. Y.	At least 7500 tons	Start in 1½ to 2 years, full output 1 yr later	Sodium reduction of titanium tetrachloride
Cramet, Inc.	Chattanooga, Tenn.	Pilot Plant at Chicago	6000 tons	Start in early '55	Kroll
Dow Chemical Co.	Midland, Mich.	Pilot Plant	1800 tons	Start Jan. '56, full output July '56	Magnesium reduction (Kroll)
Horizons Titanium Co.	Stamford, Conn.		Pilot Plant	Mid '55	Electrolysis of potassium titanium fluoride
Western Pyromet Co.	Manteca, Calif.		Ultimately 6000 tons		Modified Kroll

fying the addition of boron in making steel.

The trend toward alloyed titanium prompted development of an aluminum-vanadium alloying agent (15 pct Al, 85 pct V) already in use, and an aluminum-titanium alloy for the same purpose has been developed. It is believed that eventually 90 pct of titanium production will be in alloyed grades, which are said to be less susceptible to hydrogen pickup.

A growing interest in rare earths was noted during 1954. Several steel producers have made their addition regular practice in the production of some grades of stainless and other high alloy steels. Also, at least one large steel producer is using rare earths in the making of regular carbon steels. It is reported that several hundred heats of straight carbon steels have already been produced with good results.

Aluminum smashed its way through 1954 leaving a wide wake of shattered records, primarily in production. Capacity climbed from about 1.33 million tons to over 1.5 million tons during the year and total primary output of the industry was some 1.45 million tons.

Among the more interesting plants to come into production were Aluminum Co. of America's Rockdale, Tex., works, which is the only smelter deriving its energy from lignite, and the Aluminum Co. of Canada facility at Kitimat, B. C., which started producing in August. Plans for further expansion of the Kitimat plant were announced within two months.

Another high spot during the year was the adoption in October of the new Aluminum Assn. designation system for alloys. This avoids the hodge-podge of the old system and provides plenty of room for new developments.

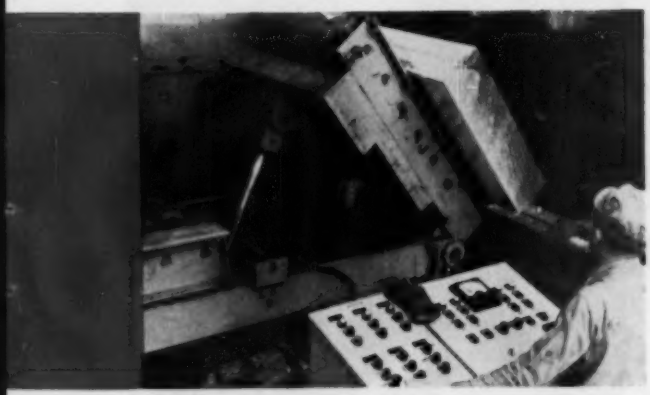
Marketwise, the year was fairly quiet, receiving only a single real jolt—the price increase in August which followed the signing of a new labor contract calling for higher wages.

After a lengthy shakedown period, Alcoa started actual commercial production with the Air Force-owned 14,000-ton extrusion press at its Lafayette, Ind., plant. Forging presses of 35,000 and 50,000 tons are scheduled for initial operation at Cleveland early in '55.

Copper production was severely disrupted during third quarter by labor trouble. As a result, total domestic refined production for the year was about 1.26 million tons as compared to 1,395,003 tons in 1953.

Even before this, the copper market defied the crystal ball gazers who had freely predicted a price decline by midyear. Deliveries to fabricators in 1954 fell 250,000 tons short of the previous year's 1,443,719-ton total but continued stockpiling and reduced production cut producer stocks to a new alltime low late in the year.

Fourth quarter supply was so critical that



MAGNESIUM ingot enters surface scalping machine at Dow Chemical's Madison, Ill., plant. A new 84-in., 4-high hot mill at the plant is used for breakdown and semifinishing.

the government released metal from its supplementary stockpile and diverted shipments from the strategic stockpile to prevent actual plant shutdowns. Tight market continues into 1955 but will become less critical gradually.

The magnesium industry moves into 1955 in a rather uncertain state. Only two major plants are operating—the ones at Freeport and Velasco, Tex.—and the twice-extended lease on the latter plant will expire at the end of this month unless it is again extended.

Dow Chemical Co., which owns Freeport and operates Velasco for the government, has offered to purchase the Velasco facility but the Justice Dept. turned thumbs down, contending the sale would conflict with antitrust laws. Nobody else seems interested either in acquiring any of the government-owned magnesium plants or in building a new one.

Renew lead, zinc stockpiling

Since Velasco is the nation's biggest producer and demand is more than Dow's Freeport plant can satisfy, Defense Dept. has deemed continued operation at Velasco necessary. But the plant's full output, together with Freeport's, is too much magnesium for current civilian and military demand and the stockpile is considered at least adequate.

A firm answer to this must be found for it constitutes a serious problem to the entire magnesium industry. That answer could be in a new program of long-range stockpiling such as in lead and zinc.

Biggest single event of '54 in magnesium was the opening of Dow's new mill at Madison, Ill.[4]

Hullabaloo over tariff hikes for lead and zinc ended in June with the start of renewed stockpiling by the government. Prices actually began to rise a few months in advance as President Eisenhower had pledged aid to the domestic mining industry but real strength did not come until second half.

Even then the strength was somewhat retarded by huge stocks, especially zinc, hanging over the market. Zinc stocks really plunged during second half but still proved a tremendous load for producers to carry. Outlook as '54 drew to a close was that prices would very likely edge upward. This view was held stronger for zinc than lead because of the gap between their prices.

Civilian users got almost 10 pct more nickel in 1954 than in the previous year. This resulted from increased production and reduced usage by the military. However, while nickel production is still on the upswing, the armed forces will be using more in 1955 and availability for nonmilitary goods will most likely decline during the year.

Total nickel consumption during the year is estimated at 95,000 tons as compared to 106,000 tons in '53. This does not include metal which entered the stockpile.

The nation is still facing the titanium dilemma it faced a year ago: Should a huge expansion be based on the Kroll process or should we gamble that a better process will be found shortly?

Government takes middle path

Actual path taken by the government in doling out contracts has been down the middle of the road—base some expansion on the only process we have and pour plenty of research into development of a better one.

Present commercial capacity of 7200 tons annually is split between E. I. du Pont de Nemours & Co. and Titanium Metals Corp. of America. Cramet, Inc., however, will soon begin production at its Kroll-type plant in Chattanooga which will have a capacity of 6000 tons.

Scheduled for initial, though not capacity, operations some time in 1956 are Dow Chemical Co.'s 1800-ton Kroll plant and the Electro-Metallurgical Co.'s plant under construction at Ashtabula, O. Electromet's will be the first non-Kroll commercial facility with sodium replacing magnesium for reduction of titanium tetrachloride.[5] Capacity will be 7500 tons a year.

But big hopes are riding on a pilot plant scheduled to start up about the middle of '55. It's based on the Horizon's, Inc., experimental electrolysis of potassium titanium fluoride.

THE IRON AGE REFERENCES

1. New Stainless Alloy "Bridges Gap" Between 300 and 400 Series, Dec. 2, p. 113. 2. Vacuum Melting Grows Up, Aug. 12, p. 71. 3. Test New Alloy Steel For Pressure Vessels, July 22, p. 120. 4. High Production Mill Rolls Wide Magnesium Plate, May 27, p. 111. 5. Titanium: Shaping a New Industry, Sept. 23, p. 65.

PRODUCTION PROCESSES

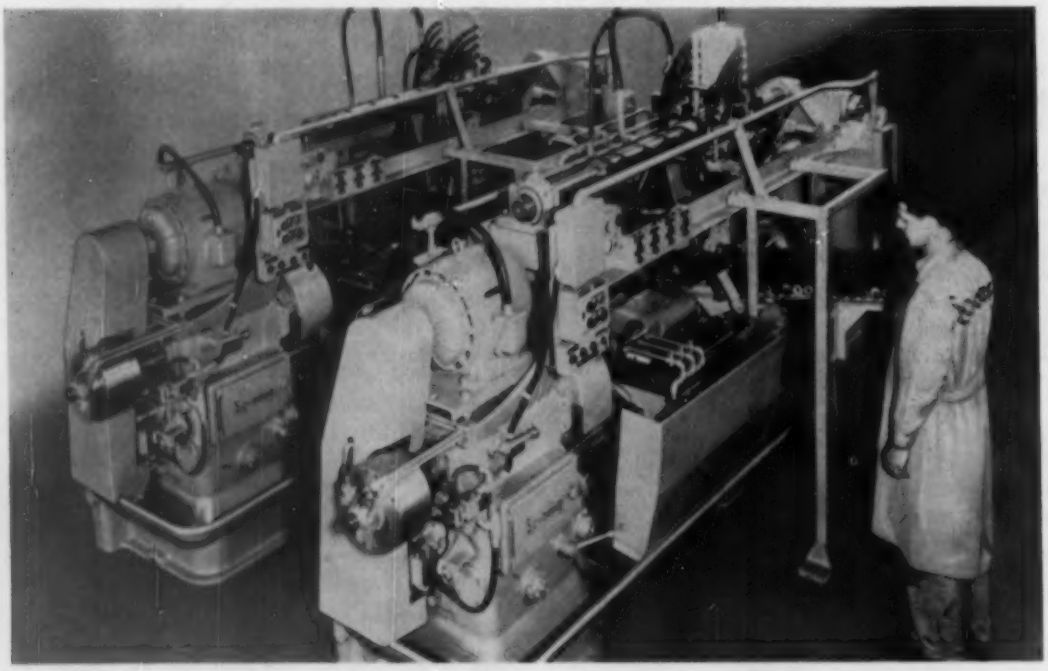
Automation . . . Extrusion . . . Stamping & Forging . . . Machining . . . Melting . . . Casting . . . Welding . . . Materials Handling . . . Metal Finishing . . . Instrumentation . . . Powder Metallurgy . . . Heat Treating . . . Testing & Inspection.

AUTOMATION

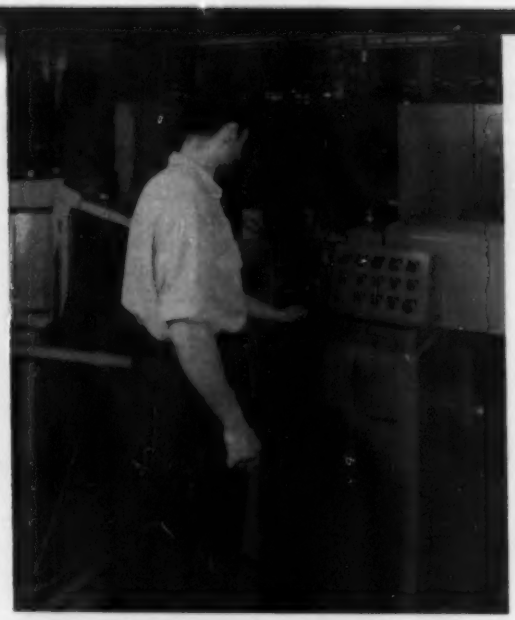
◆ AUTOMATION was no longer a novelty in 1954. The word was bandied around more than ever, but metalworking production men wasted little time trying to define it. Instead they scrambled to put this dynamic, cost-cutting philosophy to work wherever possible.

In the forging industry, speedy automatic and semiautomatic machines are shaping metal to ever closer tolerance limits. Size requirements for forging blanks are being pushed lower so that scrap losses can be kept to a minimum. Many odd-shaped parts, once expensively formed in a series of machining operations, are now being forged automatically to precision specifications.

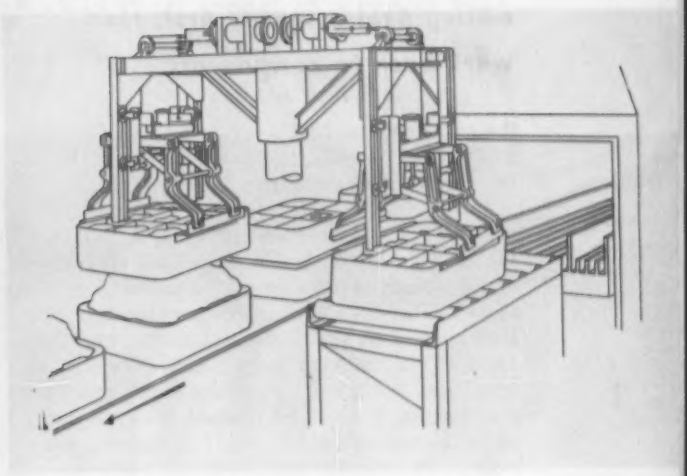
Gear finishing is also coming in for its share of attention from the automation experts. Here



TRANSFER setup automatically handles camshafts through two rapid turning and gaging cycles.



VIBRATING hopper feed, magazine loader infeed, rocker-type automatic loader and small belt conveyor are automation devices integrated with this modern rotary gear shaving machine.

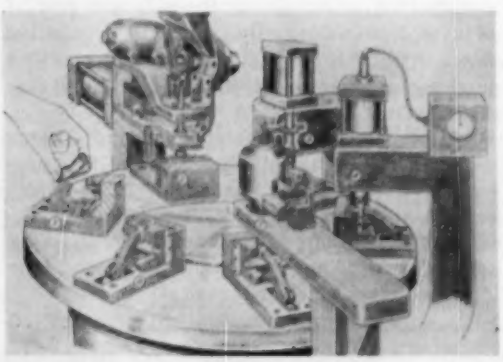


AUTOMATIC foundry device opens and closes molds, forwards copes to shakeout. It indexes 180° per flask. Cradle at right has just put flask on inclined rollers for shakeout.

the concept is not being applied from the ground up, but standard, precision gear making machinery is being blended with automatic work handling and inspection devices. Outlook is for this adding-on and building-in to continue with greater speed and precision as the goal.[1]

Actually, the current status of any automated operation is only momentarily sufficient or efficient. Some new machine, tooling material, workfeed device or inspection unit is always just around the corner. And if these things will produce more and save more than they cost, alert management will provide a ready market.

The foundry industry finds the shortage of skilled labor a compelling reason to welcome automation. And the ideal of the "untouched by human hands" theory comes close to reality with the recent installation of a 12-operation integrated line in a Cleveland foundry.[2]



AUTOMATED valve and rivet assembly features built-in testing. Stations: (1) Load and unload; (2) Assemble valve and rivet; (3) Position valve and set rivet; (4) Pressure test; (5) Torque test; (6) Eject finished work. Inspection stations aid quality production.

The automatic setup takes care of flask filling, molding, closing, clamping, cooling, stripping and shaking out. It features a series of usual and unusual handling devices and is designed to produce 300 multiple-cavity molds per hour. The entire unit occupies a floor area only one-fourth as large as that needed for conventional layouts.

Shell molding's influence on foundry automation was unmistakable last year. The process has had a startling growth from a laboratory curiosity to a practical reality. Reason: Shell molding's potential for rapid output of quality castings with a minimum skill requirement.

Efficient shell molding machines are available in single or multi-station types to match production needs. Mold output rates range from about 40 per hour on the singles to over 250 per hour on the multiple units.

One four-station shell molding unit at Buick paces the pouring ladle with more than 200 V-8 engine block molds per hour. No manual effort is required except to clean the patterns and apply the parting agent. The entire assembly occupies a floor area only 13 x 14 ft.

Many individual machine-processing steps in the metal industries have long been automatic, or nearly so. But the handling gaps between a series of push-button cycles have often been extremely wasteful of time, materials and manpower.

Although most automation advances are still confined to specific part-making operations or single departments, a significant new type of thinking is beginning to work backward from

"New thinking is to plan for automating final assembly first, then work back to components . . ."

the end item itself. Theory is to plan first for automating the end item assembly, then to tie in the various component part lines.

Since assembly line workers frequently outnumber other production personnel by 10 to 1, the challenge to automate these final operations is quite clear. According to one automation specialist, "Too often final assembly is the last decision reached in formulating plans for manufacturing. The thinking is: We can always bring in enough wrenches to put the thing together. Automation, it must be realized, may very well lie in the opposite direction. If you plan to automate, plan to eliminate as many fasteners as possible!"[3]

A start in this new direction was made with an automatic machine designed to build and assemble a control device in 98 pct less floor space than was previously needed. The machine cuts tubing to length, makes its own brazing solder, assembles the device, inspects it and finally packages the product. Saving in packaging cost alone is 6¢ per unit over the former method.

Eliminates all handling

Returning to the more conventional signs of progress, 1954 saw metal stamping plants making greater use of progressive dies and transfer presses.

One progressive die setup for making Pontiac hubcaps permits the blank to be cut loose from the strip material. No handling is required since the scrap skeleton helps transfer partially formed parts from station to station. Finished parts of desired quality are automatically pulled into tote boxes at a 500 per hour rate.

Where work must be deep drawn, the problem of removing partially formed stampings from dies may prevent the use of the progressive type. A possible solution is the use of transfer presses. This was done last year to expedite volume production of deep drawn parts at AC Spark Plug Div.

This automatic installation integrates coiled stock feed to a blanking press with blank passage through a 3-stage cleaning operation, and finally to an 8-die transfer press for progressive forming. Transfer bar movements are synchronized with the press stroke. One skilled operator supervises the entire stamping and forming operation.

In outright machining and grinding, the "urge to automate" is becoming more universal. It is sparking an almost limitless flow of machine accessory devices to shorten production cycles and eliminate the need for manual labor and machine operators.

These automation aids are usually designed to (1) bring material to the process point, (2) hold it in place during work and inspection operations, (3) segregate good from reject parts, (4) carry in-tolerance and reject parts their separate ways for further processing.

Examples of these stepping stones to completely automatic production are numerous. One twin lathe setup for turning seven diameters on automotive camshafts incorporates most of these automation aids in a neat floor-saving package. Pushing a button starts the cycle which includes loading, positioning, multiple turning and gaging, unloading and transfer to the second lathe. The latter machine, equipped with similar aids, ultimately discharges a completely turned shaft, within tolerance limits and ready for final grinding.[4]

Automate crankpin grinding

And crankpin grinding, one of the toughest cylindrical grinding jobs, was finally automated this past year with a transfer type machine. The pattern is becoming familiar: One operator supervises the entire operation. Crankshafts are automatically loaded, fed from one grinding station to another and finally unloaded.

Refinements on this crankpin grinder include such automation aids as built-in locating devices, automatic wheel truing at predetermined intervals, and automatic compensation for reduction in grinding wheel diameter. Automatic inspection has been built into a more recent model of this setup. Warning lights will signal approach of any crankpin diameter to the high or low tolerance limit.[5]

As in the cases just mentioned, automated machining and grinding progress is closely linked with built-in gaging and inspection devices. The automated machine tool or transfer line would serve little purpose if it merely speeded up production of faulty parts.

To prevent the possibility of "reject runaway," more built-in gages are checking parts after each machine operation. Off-tolerance work is stopped and shunted aside, saving the pointless cost of additional processing. By combining a counting device with the automatic gage, any specified number of consecutive rejects can be made to stop the operation completely.[6]

Scanning the 1954 automation record further shows that even the scrap-processing field was fruitful territory for the experts. In one large auto plant the scrap baler attendant has discarded his familiar, often frantic rake-handling act for a set of pushbuttons to shear and bale large tonnages of steel scrap.

THE IRON AGE REFERENCES

1. Automation in Gear Finishing and Inspection, Oct. 21, 1954, p. 228. 2. Automation Unit Performs All Operations in Casting of Small Parts, Nov. 4, 1954, p. 128. 3. Automation Demands a Bold New Approach to Parts Design, Processing Methods, Oct. 21, 1954, p. 218. 4. Automated Units Speed Turning, Gaging, March 11, 1954, p. 144. 5. Transfer Machine Automates Crankpin Grinding, April 22, 1954, p. 187. 6. Built-In Gaging Parallels Automation Growth, Oct. 21, 1954, p. 234.

GLASS IS USED as lubricant in piercing hot billet prior to extrusion at Allegheny Ludlum's integrated extrusion plant, Watervliet, N. Y.

HOT EXTRUSION of alloy steel for airframe parts at Harvey Machine Co., Inc., Torrance, Calif. Lockheed Aircraft sponsored studies.

EXTRUSION

◆ EXTRUSION, as a method of producing parts and basic material forms, continues to hold high interest for the metalworking industry. Both cold and hot extrusion, remain high on the list of processes industry is watching closely with an eye to future cost savings.

Cold extrusion of automobile piston pins appears to be a virtual certainty within a year or two.

Cold extruded aluminum pistons have apparently progressed close to the commercial stage. One company, on the basis of extensive studies, reports the pistons are to 50 pct stronger and 30 pct lighter. The pistons are heat treated to increase tensile strength and improve ductility. Fatigue life is reported longer and closer tolerances are claimed.

U. S. technicians have extended and modified the hot extrusion process brought over from France several years ago. A number of new products have been extruded successfully.

Among the growing list of materials being extruded are titanium, nodular iron, 19-9 and 16-25-6 alloys. Many of these high temperature alloys cannot be hot pierced readily.

Stainless and high alloy seamless tubing and shapes are now being hot extruded on a commercial basis at one integrated plant. All standard 300 and 400 series grades are used. Seamless tubing, 1⅝ to 4 in. in diam and 12 to 45 ft long can be produced at the rate of 25 to 30 pushes per hour. Titanium, zirconium, tool steels and high temperature alloys are being extruded experimentally with good results.

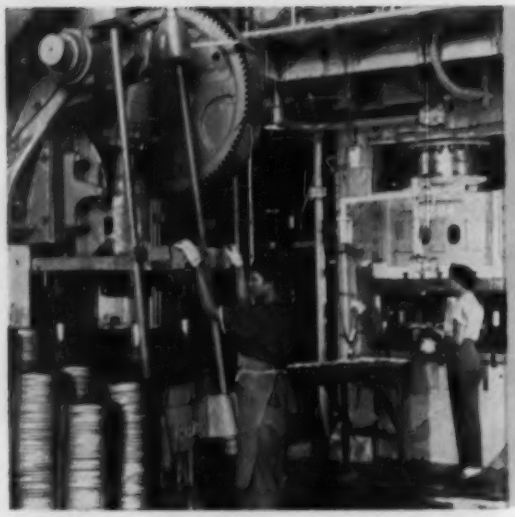
In a West Coast plant extensive studies have proved titanium, under proper conditions, can be successfully extruded. Research work at this plant aimed at developing extruded material for airframe sections. Titanium extruded better than steel and as use of the metal develops, extruded titanium is expected to play a more important part in production of basic forms.

Aluminum wheels and fans with diameters from 2 to 4.5 in. and weighing from 2 oz to 1½ lb are now hot extruded to finished sizes and to difficult contours. High speed fans, designed to spin at speeds to 100,000 rpm and made to close tolerances are produced by this method. The 14S slugs are first preheated to 950°F then squeezed out in a press at the rate of 100 per hour.

Special shapes, in which the inner and outer shapes differ in form, offer a promising field for hot extrusion. Look for continued developments in this field.

REVIEW FORECAST

STAMPING AND FORGING



CONVEYORS and other handling devices are extensively used to tie press operations together as in this trimming and coining press setup at Chrysler Corp.'s Highland Park plant.

♦ PRESS OPERATIONS, among the first to be systematically mechanized in the trend which led to automation, are being viewed in new perspective. The result is a more noticeable integration of machines and operations.

Over the years many devices have been developed to improve production efficiency. Multiple dies, progressive dies, automatic lifts and turnovers have long been used in metalworking plants. More recently, catapults, roller conveyors and automatic pickups and releases have increased the effectiveness of the earlier devices. Today, industry has automatic transfer bars for presses as well as for machine tools, automatic turnovers, dial and hopper feeds.

What has really happened is that all of the little devices that make possible automatic processing have now been put together. In some cases, the result is semi-automatic operation. In a very few cases, the result is fully automatic functioning.

By tying a great number of new devices to existing equipment with hundreds of limit switches and solenoids, the automatically functioning operation has been achieved.

Large press operations have been tied together to function as a unit. The result is spectacular—but the method is hardly new. Tying operations together in a metalworking plant actually started many years ago.

The advantages of automatic, or semi-automatic processing are evident. They include: Improved product quality, increased production, lower unit cost, reduced in-process inventories, better working conditions.[1] Other advantages include elimination of unnecessary handling operations. Tedious and monotonous manual effort is avoided. Production per square foot of floor space is increased. Production costs are reduced and product quality is improved.

Efficient utilization of the great potential of automation often requires new and daring concepts in parts loading and unloading, design, scheduling and marketing. Particularly, the potential possibilities of automatic assembly must be grasped. It is generally admitted that probably the greatest technological changes in the metalworking industry in the years immediately ahead will involve the increased application of automatic assembly of manufactured parts.

Trend to forge presses

The trend observed several years ago of utilizing forging presses wherever possible instead of forge hammers is continuing. In addition to a substantial savings in die cost, increased output per sq ft of floor space, a better quality product is attributable to forging presses.

Automation has reached a peak in cold heading operations. This is a development covering many years. At the present time, it is possible to produce up to 20 small nails per second in a heading machine. Progressive cold header operations are being performed at rates 7 to 15 times greater than machining methods previously used.[2]

The increasingly important role of forging presses, particularly for defense work, is ap-

parent. To mention one example, a vertical all-steel press at Oliver Corp. is making 155 mm artillery shells with a savings of 35 lb of steel per shell.[3]

Induction heating of forging blanks is also increasing. In some recent installations, the part is taken directly from the conveyor through a hopper or magazine, through the heating coils, past a temperature indicator and into an automatic forging machine. Handling is completely automatic.

There are also, of course, an increasing number of induction installations that are partially automatic, using hopper or magazine feeds.

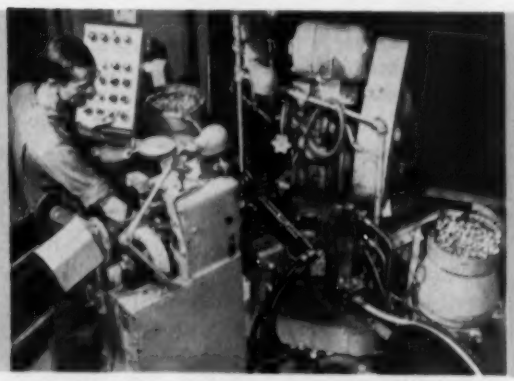
A recent installation of fast, economical electrical heating uses 60 cycle current to heat the part to intermediate temperature. High frequency current is then used to raise the part to the desired forging temperature. A substantial gain in economy is made possible through the use of dual frequencies.

Induction heating is also being used effectively to heat bars as they pass through a coil in a forging machine. The bar is heated, cut off and forged in a series of operations without reheating. A high production nut-making machine works on this principle.

More fast heat forge furnaces

A number of new forging furnaces use reciprocators to give faster heating and reduce fuel cost. Fast heating forging furnaces, so-called, are undoubtedly gaining wide consumer acceptance.

Efforts to save on press forging die costs through the use of highly alloyed die steels have had some success. While die life in small dies has been improved up to 25 pct in some cases, the life of large dies has not been increased appreciably. Experimental work in this field is continuing.



AUTOMATIC assembly of manufactured parts has a big future. Here rotary type machine, assembling fuel pump valves at Flint, Mich., plant of AC Spark Plug boosted efficiency 65 pct.

FORMING AND CABBAGING operation on 400-ton press at Oliver Corp., South Bend, plant is simplified with use of pusher type conveyor for moving heated billets in and out of press.

Increased use of scale-free forge blanks has helped promote die life . . .

Die costs continue to be a subject of careful scrutiny by most forging plants. The increased use of scale-free forge blanks has undoubtedly promoted die life. The trend away from forge hammers to forge presses has also been helpful.

Less costly dies are a "must" for the forging industry. New and bolder attempts at die typing show promise. The use of electrolytic machining for die shaping is another promising possibility.

Determined efforts are being made by forgers to reduce heating costs, whether gas, oil or induction is used. An interesting approach to this problem is a furnace recently placed in use which requires no special outside atmosphere. The present installation is experimental. This type furnace cannot be used on slot type operations.

Important savings in forging costs can be obtained by the use of ultrasonic tests for determining ingot soundness prior to forging. Allis-Chalmers, for example, is pretesting about 50 pct of their forging ingots with excellent results.

The growing acceptance of automation has, as might be expected, resulted in many recent changes in stamping press design. Improved clutches and brakes, better lubrication, and faster controls are included in the improve-

New small hydraulic presses more versatile . . . Progressive die use grows.

ments that are being made. Ability to adapt the press to automation is another requirement that is receiving considerable attention.

Meanwhile, important changes are taking place in small presses. To an increasing extent, hydraulic presses, both floor types and bench models, are taking over more operations. The new hydraulic presses are both versatile and fast.

Industry watches large press use

The versatility of the new small hydraulic presses is remarkable. Blanking, coining, straightening and trimming operations may be performed at relatively high speeds with safety and accuracy. These presses can also be used, if desired, in progressive die setups, including blanking, forming and piercing operations. The same equipment is also employed under certain conditions for die tryout.

Thus far, use of the very large giant presses has been limited to defense projects. However, industry is following these developments closely. As soon as the economic advantages of big presses are demonstrated, it may be expected that industry will have an active interest in the large presses now being used by the Air Force.

C-frame presses continue to head the field for small part work. To an increasing extent, dial feeds are being used. Single, double and triple action hydraulic presses are now available. Controls are tending to become partially or fully automatic.

Progressive dies are gaining an increasingly important place in volume production plants. At Chrysler's Highland Park plant a 350-ton 5-station progressive die setup produces up to 60 torus rings per min, thereby saving extensive handling that would be necessary if individual presses were used. Production rates as high as 600 pieces per min have been reported for some of the recent progressive die setups.

Although presently limited to very long run parts, the transfer die has emerged as an excellent performer for deep drawn stampings that could not be made on a progressive die. Using steel blanks and steel arms to transfer the stampings between stations (instead of pulling the part through with the strip), parts like oil filter shells are being produced in large volume. There is a large savings in the cost of steel as well as a substantial increase in output per square foot of floor space.[4]

Low cost plastic tooling is taking on more jobs. Potential savings are large. One of the major motor car producers has used plastic tooling to make 17 different stampings.[5] Plastic dies produce a good finish and can be built quickly. The new plastic dies appear to work best on light gage material where relatively long runs are wanted. However, a limited number of parts can also be made on relatively heavy gage steel.

Plastic form dies are finding increasing, although limited use, by both small and large stampers. While it is still too early to predict the ultimate place of plastic tooling in the large volume production industries, considerable technological progress has already been made. While the auto industry appears to be feeling its way very carefully with plastic tooling, plastic checking gages and assembly fixtures have already won wide acceptance.

Eventually, the use of hardened steel inserts in plastic dies may offer some interesting possibilities. This method has already been used with some success but more experience is needed. Not all of the attempts to use steel inserts in plastic dies have been successful. The ultimate position of plastic dies seems virtually certain to be extended considerably beyond prototype, standby and short run applications.

Plastic dies have longer life

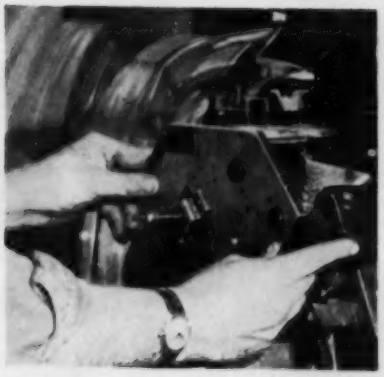
Recent development of a remarkably hard surfacing material for plastic dies will undoubtedly contribute to longer life although operating results are still too limited to permit evaluation of this development. The use of special filler material, including iron filings, is another possibility.

Another development that will bear watching is combining plastic with Kirksite or with Kirksite and iron. A savings of 25 pct in time and 40 pct savings in production costs has been reported for a metal and plastic die used to make a luggage compartment cover panel die.

The use of stretch forming, rubber pads and hydraulic fluids for metal forming continues to interest many stamping plants. This development is coming along—but slowly. The process will undoubtedly be extended as soon as the forming possibilities and economic factors are accurately assessed.

THE IRON AGE REFERENCES

1. Automation: Today's Challenge to Process Engineers, Oct. 21, p. 214. 2. Automatic Equipment Leads Trends in Improving Forged Products, Oct. 21, p. 231. 3. Improved Forging Methods Save Steel, Raise Shell Output, Apr. 8, p. 145. 4. Design Tooling for Complete Automation, July 1, p. 114. 5. Low-Cost Plastic Dies Take On More Forming Jobs, June 10, p. 115.



TOOLSETTING device sets three tools at this turret station while the lathe is running.

REVIEW FORECAST

MACHINING

◆ THE METALWORKING INDUSTRY took its first look at a couple of new, so-called "chipless" part-making methods in 1954. But most machining progress was still concentrated in those areas where traditional chip removal techniques are likely to remain standard practice.

First machine tool builder to publicly break the ice on the "chipless" concept was The Lodge & Shipley Co. The firm demonstrated a "Floturning" machine designed to cold-form cylindrical and conical parts over a rotating, spindle-mounted mandrel. A metal blank of predetermined size and volume is quickly pressure-tooled into a close-tolerance end item. Result: very little metal to be trimmed away and none wasted in the form of chips.

The company is not predicting that the new process will eliminate conventional machining operations on a large scale. Assumption seems to be that this high pressure rotary forming method will compete more effectively with stamping and deep drawing. Possibility for further development of the rotary-flow technique is indicated by news that somewhat similar equipment will be announced by another major tool builder sometime next year.

Splines are cold rolled

Considerable interest was also shown in a "chipless" spline rolling machine introduced by Michigan Tool Co. early last summer. Splines and serrations are cold formed under heavy pressure by rotating cylindrical shafts between two laterally moving racks. Forming teeth on both racks grip the shaft and penetrate progressively deeper as it revolves. The technique is said to reduce the need for hobbing in producing straight and helical splines, oil grooves, serrations and similar shapes.[1]

Serrated shafts are being cold formed in production quantities at Saginaw Steering Gear Div. by a thread rolling process. This method uses cylindrical die sets mounted on Reed and National Acme thread rolling machines.[2] Other advantages of these spline-forming methods include improved surface finish, longer tool life, higher product strength, increased production and complete elimination of the chip removal problem. And important savings in metal stock requirements are indicated. Shaft material can be purchased in the exact diameter required so that the metal displaced into splined serrations will be within tolerance limits. There will be no excess metal to remove.

Feeds and speeds rise

Elsewhere, the past year saw increasing emphasis placed on high speed metal cutting. More machine tool users were discarding traditional limits on feeds and speeds, and revising them to higher levels.

Pressure on the industry for faster machining cycles came from two directions. One was the rough competitive scramble for business carried over from 1953. The other was a giant array of new machine tools, cutting tools and machine tool accessories geared to the high speed concept.

New machine tool models in virtually every category were introduced during 1954. Most were major redesign projects rather than face-lifted versions of former types. The general trend toward more powerful drives, more flexible controls was clearly evident. Builders seem determined to regain the lead in their constant race with cutting tool manufacturers for metal removal capability. One builder describes his new lathe by saying, "It has the speed to burn and the power to break any cutting tool we know of."

Along with the trend toward higher speed and more power, builders are developing more automation aids for their customers. A greater variety of work handling fixtures and inspection

Metal removal rates have climbed to new highs in advanced design machine tools . . .

devices were supplied by the builders last year.

In the turning field, an automated dual lathe setup was developed for handling volume work to precision standards.[3] The original model was designed for turning multiple diameters on automotive camshafts, but the builder claims the tandem assembly can easily be adapted to a variety of turning jobs.

The twin installation features completely automatic part loading, handling and transfer between the two lathes. Multiple carbide tooling is of the preset type for quick changing. A built-in multiple gaging system checks each diameter after it is turned, and will shut off the cycle if any dimension is out of tolerance.

One man operates and observes this automated setup from a control and signal panel location. There is no need for individual lathe hands or part inspectors. But for added flexibility, either lathe can be quickly switched to full manual operation.

Flexibility a design factor

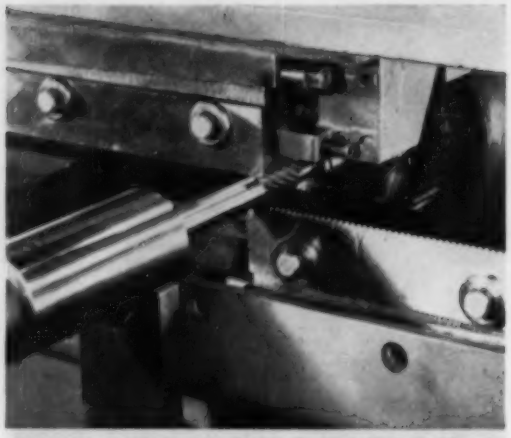
In many cases modern machine tools and cutting tools have combined to push metal removal rates near a practical maximum. This spotlights setup time and handling as the best potential areas for cutting floor-to-floor cycles still more. Builders are not neglecting their studies of faster chip removal, but they are giving much more attention to machine flexibility for quick job changes.

Setup time for short runs on diversified small parts can often mean the difference between profit and loss. And now certain 1954 model automatics are bidding for these 100 to 5000 piece jobs. In many cases this is traditional turret lathe territory, but some shops have made the switch. The new, flexible automatics now claim low setup time plus "pushbutton" operation for unskilled help.

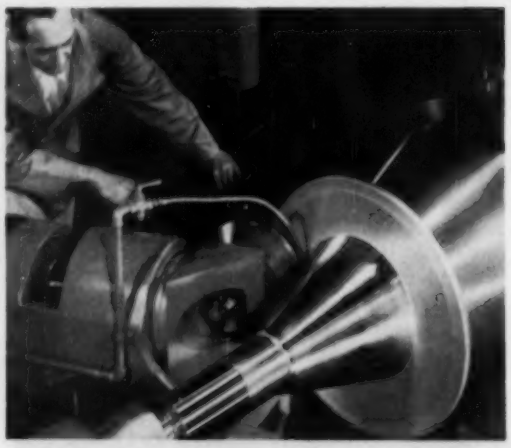
Trepanning techniques were advanced last year, particularly in the manufacture of thick-walled tubing.

Even simple trepanning attachments on heavy duty lathes have been quite successful in some instances. One firm used an attachment to make 6-in. wide by 32½-in. deep holes in solid steel forgings on a production basis. The old method of drilling and finish boring took 30.6 hours per hole. The new system makes two trepanning cuts and a finish bore in just 8.5 hours. Solid cores produced by the trepanning tool are bonus items used to make miscellaneous shafts, collars and gears.

A newly developed special trepanning lathe



IT TOOK only a few seconds to roll this helical spline between the upper and lower racks.



"CHIPLESS" method flows cold metal against a mandrel to form a jet engine exhaust cone.

for heavy duty work features high spindle horsepower, a wide spindle-speed range and a high pressure system for volume coolant flow. Penetration rates exceed 4 ipm on a 5½-in. diam hole 26 ft deep. Work up to 50 ft long can be easily handled in a normal machine setup.

A new steel cutting cemented carbide said to be 30 pct more effective than present types for light roughing and general finishing was introduced last year by Carboloy Dept. of General Electric Co. It combines toughness and wear resistance and is said to hold an edge to 1800° F.

Carboloy also started a joint research program with the Cone Automatic Machine Co. The program calls for a continuing investigation rather than a short-term study. Purpose of the long range survey: To extend the application of carbide tooling to multiple spindle automatics.

Justifying only partial carbide tooling on automatics has long been a problem. Shop men have contended that there was little or no advantage to be gained by fast carbide cutting

at some stations as long as others had to be equipped with slower speed tools.

But when first results of the cooperative research program were demonstrated early last summer, the benefits of 100 pct carbide tooling were impressive. Several difficult jobs, formerly handled with high speed steel tools, were effectively turned out in sharply reduced time. For maximum carbide performance, automatics must be exceptionally rigid, with tight bearing seals. Rigidity is necessary for smooth operation at the full carbide speed and feed potential. Tight bearing seals keep coolant out of the machine tool's lubricating system.

Apart from the carbides, the relatively new sulphurized high speed tool steels gained in sales volume last year. Most major tool steel producers now offer sulphur-bearing grades of their more popular alloys. Biggest use of these more machinable tool steels is for making unground gear hobs, plus some die work. Continuing performance tests in other tooling areas should bring some more positive answers in 1955.

Of the many new types of tool holding and support devices coming on the market to boost the high speed machining trend, some are excellent. But a great many are too new to have been fully judged over a wide performance range. Net effect of all these aids is on the plus side as far as high speed enthusiasts are concerned.

Carbide insert use spreads

There was a noticeable trend toward more quick-clamping toolholders during 1954. Some have built-in chipbreakers and will convert from a negative to a neutral rake. Others feature the use of carbide inserts which can be indexed several times, then thrown away.

For quick tool changing on multiple spindle machines, one firm uses a unique commercial device.[4] Tools can be set to ideal, repetitive accuracy with no dependence on manual skill. Tool resetting on the company's automatic turret lathes is done in an average time of 24 seconds per station. And the work is performed while the machines are operating.

The firm uses over 375 of these tool setters on a variety of machining jobs and machine tools. The accurate, foolproof units have replaced former time consuming methods involving scales, verniers, dummy workpieces and special gages.

With machines, tools, methods and materials all catering to the demand for faster machining cycles, cutting fluids keep coming in for their share of attention. They play an increasingly important role in reducing friction, improving work quality, saving tool wear, preventing rust and dissipating heat.

Machining of titanium studied

Trend toward greater use of water-soluble compounds to make cutting fluids became more noticeable last year. This was especially true in the area of multiple-tool high speed production machining. But the familiar straight cutting oils are still preferred at cutting speeds below 35 sfpm.

It is only a few years since the first hesitant steps were taken to machine titanium and the new high temperature alloys. In 1954 the approach was speeded and lengthened into more confident strides. Detailed machinability studies reported last year have dispelled much of the mystery surrounding these "wonder metals." They answer questions on feeds, speeds, tool life, power requirements and other important factors. The combined reports provide a useful guide for any shop required to machine these new materials.[5,6] Included are basic data on machining feeds and speeds, including turning and milling, plus data on grinding operations commonly used in most shops.

THE IRON AGE REFERENCES

1. Develop New Method for Cold Rolling Splines, June 24, 1954, p. 110. 2. Cold Rolling of Serrations Strengthens Shaft, Lengthens Life, Oct. 28, p. 92. 3. Automated Units Speed Turning, Gaging, Mar. 11, 1954, p. 144. 4. Accurate Setups Cut Tool Changing Time, Speed Production, June 17, 1954, p. 152. 5. How Does Titanium Machine?, Jan. 21, 1954, p. 100; Jan. 28, p. 120; Feb. 4, p. 146. 6. Air Force Machinability Report, May 6, 1954, p. 128; May 20, p. 144; June 10, p. 122; July 22, p. 112.

TABLE SPEEDS AND FEEDS FOR MACHINING TITANIUM

Material	Hardness, Bhn	High-Speed Steel		Cast Alloy		Carbide	
		Speed, fpm	Feed, iptn	Speed, fpm	Feed, iptn	Speed, fpm	Feed, iptn
Ti-75A	170	90–110	0.003–0.006	120–140	0.004–0.008	160–190	0.004–0.008
RS-120	302	60–80	0.003–0.006	90–110	0.004–0.008	120–140	0.004–0.008
RC-130B	311	50–70	0.003–0.006	80–100	0.004–0.008	100–120	0.004–0.008
Ti-140A	321	50–70	0.003–0.006	60–80	0.004–0.008	80–100	0.004–0.008
Ti-150A	341	50–70	0.003–0.006	60–80	0.004–0.008	90–110	0.004–0.008
MST 3A1-5Cr	363			50–70	0.004–0.008	80–100	0.004–0.008

REVIEW FORECAST

MELTING

TAPPING a 10,000-lb high frequency induction furnace at the Sandusky Foundry & Machine Co., Sandusky, Ohio. Unit is one of several used to melt metals for centrifugal castings.

◆ PURER, CLEANER METALS hold the answer to many engineering problems presented by modern high temperature and high stress operations. Cleaner metals are known to have greater strength and improved physical properties. Melting equipment and methods generally are being reexamined by metallurgists in an effort to produce purer metals.

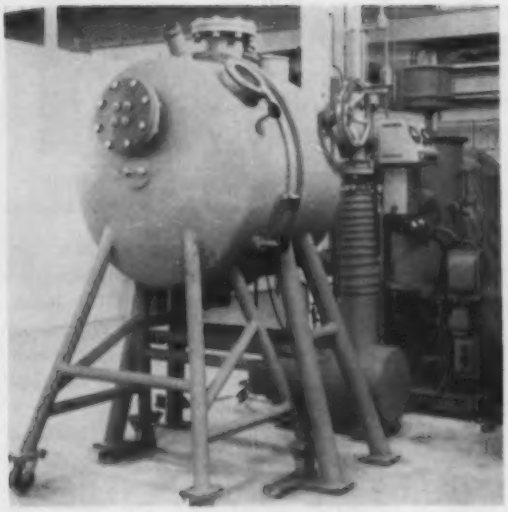
Look for a long time trend toward procedures which guarantee cleaner metals. Production men have already demonstrated that cleaner, stronger metals can be successfully produced with specialized techniques. Big problem now will be to obtain cleaner metals from normal production methods. That means closer control of scrap and other charge materials. In the melting and handling, emphasis will be on use of methods and equipment which assure a cleaner product. Greater stress on quality control procedures will be made by producers of basic materials and by foundrymen.

Vacuum melting has proved to be one successful means of obtaining clean metals. The vacuum melted steels have shown improved fatigue life and impact properties and are being rapidly accepted for applications in the aircraft, electronic and automatic processing fields. The improved properties of vacuum melted alloy steels have been especially useful in the high temperature ranges.

Commercial production of vacuum melted steels is headed for extensive growth. At least seven companies have either started or indicated they plan to get into vacuum melting on a commercial scale. Present production is estimated at from 12 to 20 tons per month and industry experts foresee capacity of 500 tons per month within a year. This expansion has been backed up by rapid development of equipment and solution of processing problems.[1]

Tests show that vacuum melting increases stress-rupture life of turbine blades 2½ times over conventional arc-melted material. These high-purity alloys allow jet engines to operate

ZONE MELTING technique, developed by W. G. Pfann and J. H. Scaff of Bell Telephone Labs refines germanium to almost absolute purity. Metal is then cut up for use in transistors.



GROWTH OF VACUUM melting has brought demand for laboratory melting and casting furnaces such as this unit designed by Consolidated Vacuum Corp. to produce melts from 5 to 50 lb.

at higher temperatures for longer periods of time. Serviced life of parts is lengthened.

Two furnaces with a capacity of 1000 lb per heat are now in production. These units will be capable of turning out 15,000 lb of high temperature alloys per day. Producers of jet engine parts have also developed equipment or are following separate research programs aimed at developing vacuum melted high temperature alloy.

Wider use of low and high-frequency induction melting furnaces, especially for larger applications, is a definite trend in melting operations. Foundries are installing equipment of this type both as replacement units and in expansion programs. The induction melting units are being used to widen the range of materials which can be melted and permit greater control over metal quality.[2]

In some zinc and aluminum diecasting operations, low-frequency induction furnaces are being installed for melting and holding. These furnaces tend to keep dross down and permit close control of melting temperatures. Linked with modern devices for handling and moving molten metals these furnaces permit diecasing plants to easily reach virtually continuous diecasting production.[3]

An unusual but important development is the zone melting technique developed for purification of germanium. The process, which yields a product of 99.999,999 pct purity, was developed to provide pure germanium for transistors.

The refining operation is based on the fact that impurities are not equally soluble in the solid and liquid states of a substance. Generally, solubility in a liquid is higher. Trick is to slowly move a narrow molten zone down the length of an ingot. The moving molten zone carries impurities with it. A series of circular induction heaters do the job.

Only a short time back some engineers were predicting a 150-ton limit to the size of electric furnaces. This year one company installed a 200-ton electric furnace. This reflects the challenge electric furnaces are making to established steel melting operations. Growth in the market for alloy steels and the need for cleaner metals generally are factors in the continued expansion of electric furnace operations.[5]

Many advantages are seen for the double melting technique in production of zirconium and titanium ingots of improved homogeneity and purity for experimental use. The method gets around the extreme chemical activity of the molten metals. Through the use of inert gases or a vacuum, gas contamination can be avoided. Production of unalloyed zirconium from sponge, with a 95 pct recovery, in the form of finished, flaw-free ingots is now possible.

Economies in foundry cupola melting operations are being achieved through use of an improved foundry coke. The coke has a high density and low internal porosity. It is low in sulphur and has an ash content of about 4 pct. Melting rate and metal fluidity have been increased about 35 pct. Greater flexibility is also obtained in melting operations.[6]

THE IRON AGE REFERENCES

1. Vacuum Melting: Grows Up, Aug. 12, p. 71. 2. High-Frequency Induction Furnaces Boost Melting Capacity, Widen Range of Metals Handled, Oct. 28, p. 95. 3. New Diecasting Plant Features Melting, Handling Economies, Sept. 2, p. 108. 4. Zone Melting: Purifies Germanium, Mar. 11, p. 78. 5. Expansion: McLouth Taps First Heat of 200-Ton Electric Furnace, June 3, p. 95. 6. Improved Coke Cuts Cupola Operating Costs, Aug. 5, p. 97.

CASTING

REVIEW FORECAST

General Foundry

◆ CAST METAL producers, seeking solutions for basic problems, are turning to new methods and equipment designed to maintain the industry's competitive position. Foundries, faced with keen competition from more highly mechanized branches of the metalworking industry are using more automation. Increased use of diecasting holds new promise for the future of the diecasting industry.

The trend to automation has brought new concepts of foundry organization and operation. Because of the nature of the foundry process, automation of foundry operations has been slow. Some engineers now feel many foundries can be readily automated.

Many units plant tested

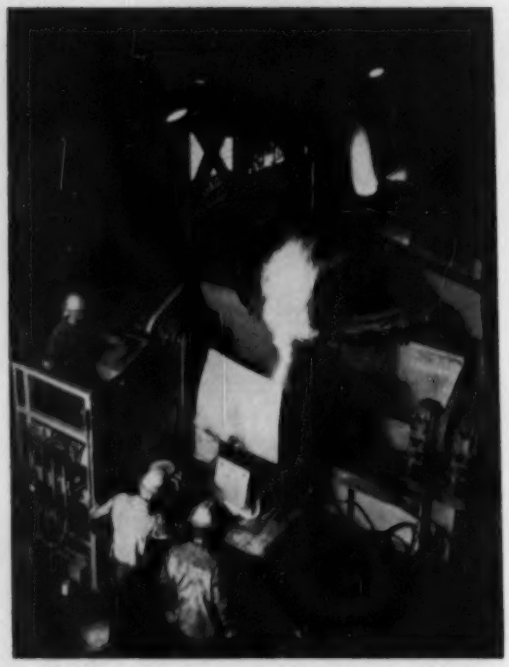
Many of the units essential to foundry automation have long been in use and are thoroughly plant tested. Typical of such machines are mold rollover devices, weight handling conveyors, devices for opening and closing molds. These must now be integrated with standard handling devices and automation units.[1]

A chief need in applying automation to the foundry is standardization of handling surfaces of ladles, flasks, core boxes, driers, core setting fixtures and other containers. High production foundries face few problems from the standardization angle. Many jobs are run continuously and in such quantities that automation may be designed for a particular operation. Jobbing shops, however, have a more difficult task. Jobbers must adapt non-uniform patterns supplied by casting buyers to a standard flask and pattern size. Use of a filler and adapter plate has solved this problem for some jobbers.

Equipment producers are backing this trend by rapidly developing new devices which solve foundry mechanization problems. A fully automatic molding machine eliminates manual handling of flasks and finished molds. The machine can produce 200 engine block half molds per hour.

Sand handling is a major problem in any foundry operation. In one large plant huge quantities of core sand are moved by air from preparation centers to coremaking machines. In a two-shift day 960 tons of prepared coremaking sand can be handled. One operator, from a central control panel, can monitor the level of sand at each coremaking machine.

Engineers have also designed completely automatic units. One such unit permits automatic



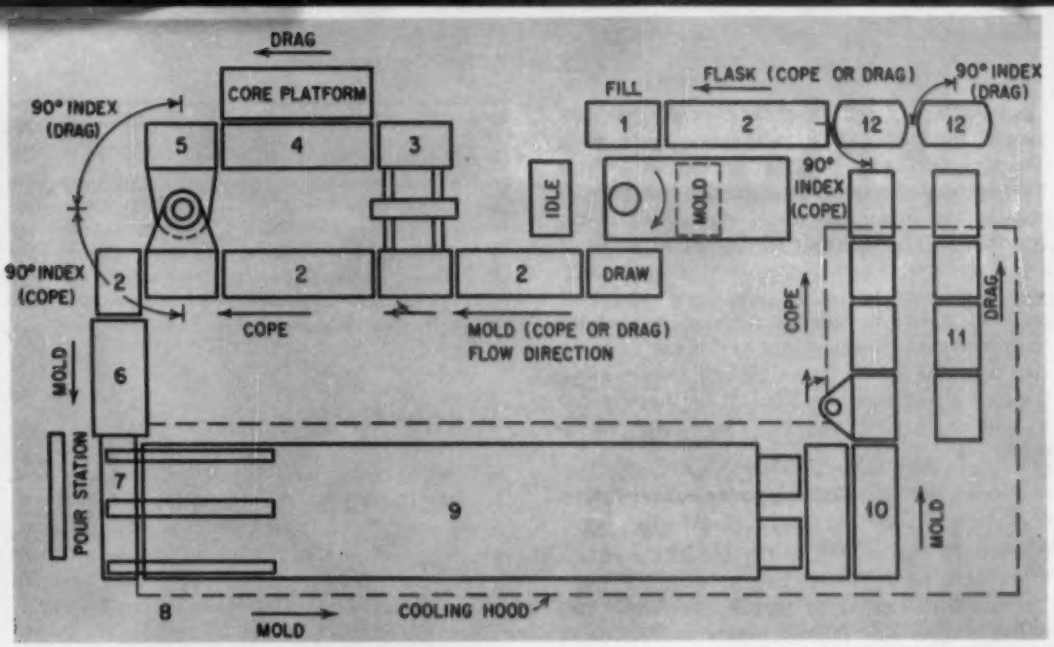
MOLTEN METAL is poured from special 35-ton ladle held in automatic tilting cradle in the continuous casting of stainless steel at the Welland, Ont., plant of Atlas Steel Ltd.

foundry operation from filling flasks to shakeout. The equipment is integrated with a series of usual and unusual handling devices. Interlocking controls permit the units to operate together. Twelve separate operations are combined in the system. Production in this installation is expected to reach 300 multiple cavity molds per hour. Major savings in labor and space requirements have been achieved. Only a quarter of the floor area needed for more conventional foundry layouts is required.[2]

Improved equipment available

One big advantage of shell molding has been its adaptibility to mechanization. Rapid acceptance of the process has been partly based on the industry's need for a production method which could be readily mechanized.

Biggest step forward in shell molding has been the recent availability of improved fully automatic and semi-automatic machinery capable of producing shell molds rapidly and with a minimum labor requirements.



AUTOMATIC MOLDING unit, used by Eberhard Mfg. Co., Cleveland, automates foundry operations from filling flasks to shakeout. Units include: (1) Molding machine, (2) Roller conveyors, (3) Drag rockover machine, (4) Roller conveyor, (5) Close machine, (6) Transfer machine, (7) Pour station, (8) Weight setter, (9) Cooling conveyor, (10) Elevator transfer machine, (11) Automatic shakeout, (12) Flask transfer machine. Unit, designed by Osborn Mfg. Co. of Cleveland, assures major savings in labor, produces 300 multiple cavity molds per hour, promises big savings in casting costs.

More plants are putting shell molding to work on a production basis. Many producers, however, have moved cautiously, preferring to evaluate the process thoroughly before becoming too deeply committed.

A greater number of good, small machines are available for shell mold production. These smaller units permit the jobbing foundry to try shell molding without making too large an investment. One machine capable of producing shell molds and cores, is priced at $1400 in the smallest size.

A new coke for foundry operation has aroused considerable interest among foundrymen. The improved coke, more dense than conventional foundry cokes, and characterized by low internal porosity and more uniform structure, has permitted new economies in foundry operation. Melting rate and metal fluidity can be increased about 30 pct. Cost of the metallic charge can be reduced in some cases through substitution of less costly materials.[3]

In the production of metals and castings industry is aiming for a purer and cleaner product. In all foundry operations process control is receiving renewed emphasis. Close control of scrap and extra care in melting and cleaning operations make it possible for many foundries to achieve new highs in casting quality.

A new precoating material that successfully resists heat shock has been teamed with use of plastic patterns and centrifugal casting to reduce the time cycle for making ferrous investment castings.

Investment casters are expected to make wider use of ceramic shell molds in the future. More extensive use of vacuum melting and pouring equipment will permit improved metallurgical quality.

Continuous Casting

◆ CONTINUOUS CASTING of steel and magnesium took a big step forward in 1954. Each application emphasizes the growing importance of the continuous casting method. Continuous casting of steel at the Welland, Ontario, plant of Atlas Steel Ltd., is now a production reality.[5] Continuous casting of magnesium at the Madison, Ill., plant of The Dow Chemical Co., using the direct chill method, has proved successful.

Production at Atlas will be centered on stainless and specialty steels. The continuous casting machine, built by Koppers Co. under Continuous Metalcast patents, stands four stories high. Used to cast 5½ x 7½ in. billets and 5½ x 21½ in. slabs, most production to date has been in the 300 and 400 series stainless steels. The machine is of the same general design as other Rossi-Junghans units.

Molten steel is available from six Heroult-type electric furnaces ranging from 5 to 50 tons. From the time metal is poured into the ladle until casting starts, metal temperature does not drop more than 100°F.

Metal is poured into a special 35-ton ladle

lined with fire and insulating brick and preheated to 2400°F. The slag dam and spout, designed for under pouring, prevent slag from flowing into the tundish. The charged ladle is transported to an automatic tilting cradle for pouring. A high velocity oil burner attached to the ladle cover close to the pouring spout, creates a stirring action in the metal when the ladle is tipped for pouring. This stirring action improves metal homogeneity and holds back the slag from the spout. The high heat burner keeps the melt at temperature, eliminating the need for a holding furnace and other auxiliary equipment.

Casting rates conservative

Casting rates, conservative to date, have reached 75 ipm on 5½ x 7½ in. billets. Slabs 5½ x 21½ in. have been cast at 40 ipm.

Continuous casting of magnesium rounds and rolling ingots has proved highly successful at Dow Chemical Co.'s Madison, Ill., plant. Both mold and cast metal are cooled by direct water spray. Rounds from 6 to 18¾ in. in diameter and rectangular ingots 11¼ x 42 in. are cast.[6]

THE IRON AGE REFERENCES

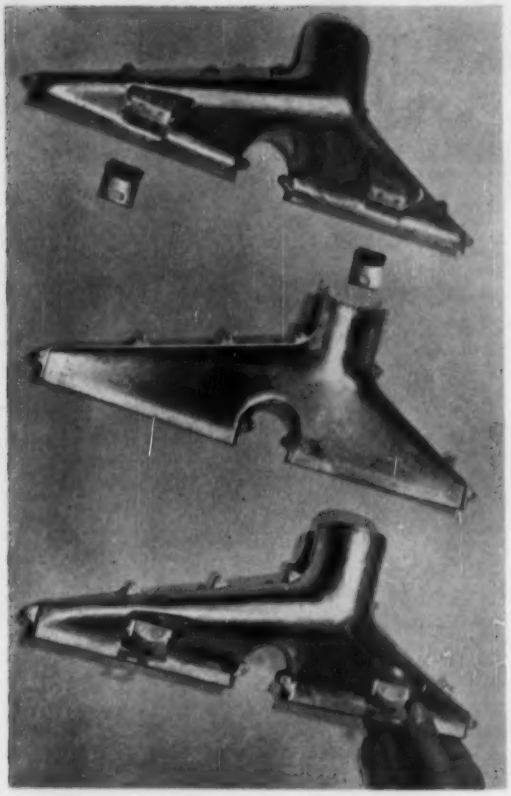
1. Automation Within Reach of Many Foundries, Oct. 21, p. 224. 2. Automation Unit Performs All Operations In Casting of Small Parts, Nov. 4, p. 128. 3. Improved Coke Cuts Cupola Operating Costs, Aug. 5, p. 97. 4. Foundry Core Sand Delivered By Air, Jan. 21, p. 97. 5. Modern Steel Plant Teams Continuous Casting With Planetary Mill, Nov. 4, p. 113. 6. Direct Chill Continuous Casting of Magnesium Proves Practical, Economical, Dec. 9, p. 149.

Diecasting

◆ OFF TO A GOOD START during the first quarter of the year, the diecasting industry ran into a second and third quarter stumbling block which pulled industry sales volume below 1953 levels. An upsurge during the fourth quarter was not enough to offset these earlier losses.

Sharply reduced buying by automotive manufacturers during second and third quarters was an important contributing factor to the decline. Automakers, some discontinuing their 1954 lines as early as May, started retooling

COVER half of 25-ton cable reel flange die. Aluminum die casting made on this 72-in. machine weighs 31 lb after it is trimmed.



SEPARATE fasteners are eliminated in defroster duct which has two diecast halves with integrally cast rivets and 2 mounting tabs.

for new models much earlier than in other years.

The appliance industry, another major customer of the diecasting industry, did not go through such a violent upheaval. Spotty conditions during the year, however, did not make for record-breaking production. A drop in government ordnance orders further reduced orders for diecastings throughout the year.

All in all, 1954 shaped up pretty much like this. The first and last quarters of the year kept about equal pace with the same quarters in 1953.

Outlook for '55 bright

However, second and third quarter losses will probably account for about a 20 pct total drop in zinc diecastings for the year. Overall volume of aluminum diecastings will break about even with 1953 with a slight chance of going higher.

Despite the fall off in 1954 the outlook for 1955 is bright. This is not just new year optimism. Increasing use of diecasting by the automotive industry holds the promise of even greater markets in the future.

Some idea of the expanding use of zinc die castings by the automotive industry is obtained when it is considered that in one of last year models, the number of zinc diecastings increased about 21 pct by weight or 10 lb per car over the previous year.

Most of the weight went into a zinc die cast grill which was chosen for his application because of design considerations and adequate strength. Other parts, include, defroster ducts, port holes, moldings, trim and functional applications such as fuel pumps, carburetors and speedometer assemblies.

One notable example is the greater use of zinc diecastings for automobile grills. In 1953, two models of cars employed zinc diecast grills. Now this figure has jumped to about nine.

The increased use of automatic transmissions has also greatly expanded the market for aluminum diecastings.[1] Use of diecast aluminum housings for automatic transmissions has expanded rapidly. Earlier adaption of aluminum diecastings for automatic transmission components heralded a major growth movement in the diecasting market. Some sources predict that by 1959 or 1960 every car made will be equipped with automatic transmissions. Automotive air conditioning offers another promising market for diecastings.

Goal: diecast engine block

Aluminum diecastings weighing up to 75 lb were made possible during the year by the development of a 72-in. diecasting machine.[2] Until this machine was designed by the Doehler-Jarvis Div. of National Lead Co., aluminum diecastings weighing 20 lb were considered maximum for the industry. Top weight of zinc diecastings claimed possible with a machine of this size is 200 lb, compared with previous top weights of 45 lb. It will handle dies weighing up to 50 tons.

The machine was designed with a diecast aluminum engine block as its major goal. The automotive industry has long been interested in aluminum as block and head material. Major immediate advantage for a diecast aluminum block is its weight saving possibilities.

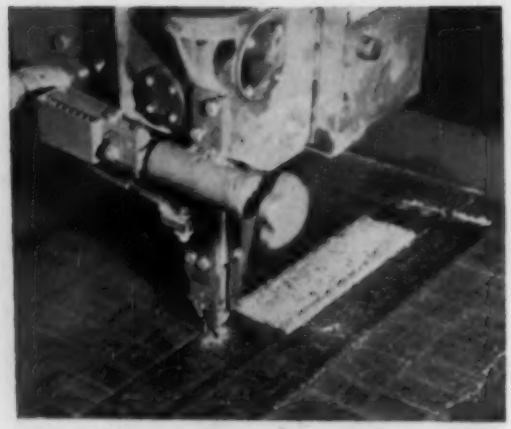
As cars get heavier, and the necessity for cutting weight becomes more vital, the automotive industry resistance to an aluminum block may be broken down.

However, some are convinced that the switch will not be made on the basis of weight saving alone. Until the industry is assured that the economies of a die cast engine block and head are enough to overcome scrapping investments in foundry and engine machining facilities there are many other large parts which can be converted, such as: die cast rear deck lids, instrument panels and door frames.

THE IRON AGE REFERENCES

1. Zinc Diecastings Lower Assembly Costs Through Better Fits, Oct. 15, p. 138. 2. Develop New Machine For Large Aluminum Diecastings, July 15, p. 118.

HANGER STUDS welded to billets provide a convenient means of conveyance to subsequent furnace treatment. Welding takes only a fraction of a second to achieve a strong bond.



TWO RODS melt simultaneously as welding head oscillates to make wide, shallow hard surfacing layers. Rods are of mild steel and alloying is accomplished by using an agglomerated flux.

REVIEW → FORECAST

WELDING

◆ FORECASTERS are already at work predicting a good year for the welding industry in 1955. This optimism is based on an upturn in welding sales toward the latter part of '54. Electrode suppliers, experiencing a summer decline, are hopeful that the present trend will carry well into the new year.

Electrode sales for 1954 will be about 110 million lb off the 1953 figures. Much of this decline was blamed on an inventory bulge in consumers' hands. However, inventory reductions were being made slowly, setting the stage for welding salesmen to move in. The gunsights for '55 are set at the '53 totals.

Several sources agreed that sales volume of welding machines slumped more than that of electrodes.[1] This was attributed to the slowing of defense buying and capital expansion. But here too was an upward trend, not booming but moving ahead steadily.

To back up their faith in the immediate future for welding, equipment manufacturers, and suppliers alike moved ahead with building programs to meet the demands of old markets and supply new markets. Only recently, General Electric Co. set up completely modern manufacturing facilities at York, Pa., for generators, transformers and other equipment.

Air Reduction Co. also took a forward step with the opening of its new ultra-modern Riverton, N. J., oxygen plant. This plant will supply up to 70 million cu ft of oxygen monthly to the industry-rich Delaware Valley. Other firms have built or are planning new plants or adding to existing facilities.

There's no doubt that equipment producers are optimistic about 1955. If current forecasts are anywhere near correct, there is good reason for it. The tempo of things to come will not allow procrastinators to shove aside cost-saving equipment for too long.

Researchers continued to plug along on their overloaded programs seeking to unravel the industry's problems. They came up with many answers to demands for better, faster and more accurately controlled equipment. Many of their developments are helping the steady march toward getting quality welds without the need of the artisan's hand.

Titanium technology grows

One such development improved welder design for percussion welding of wire spring type relays. As a result of this advanced work, millions of satisfactory welds have been made with exceptional accuracy of location, good weld strength, and at tremendously high speeds. This automatic welding method is particularly applicable for joining dissimilar metals and metals having high thermal and electrical conductivity.

Problems in welding titanium are gradually being licked. Techniques have been developed at Glenn L. Martin Co. to enable production line welding of this metal under normal atmospheric

conditions. Welds are not only satisfactory, but test results exceeded the original requirements.

In quest of higher welding speeds, Kaiser Aluminum & Chemical Corp. put to use a Yoder mill equipped with an Allis-Chalmers induction heater for the production of aluminum irrigation pipe. The mill forms and welds 4-in. tubing at the rate of 62 fpm. It not only cuts the cost below that of extruded tubing, but gives higher mechanical properties.

At least some of the secrets to successful sigma welding seemed to have been locked in the electrode coating. While one firm claimed development of a chemical treatment to remove oxides from the wire for better arc stability and fusion, another firm was promoting an electrode with an "activated" coating, also providing a more stable arc. Still another firm was applying an oxidized coating for the same purpose. The fact is that welds are getting better and applications broader.

Not to be overlooked is the wider acceptance of the contact or powdered metal electrode. Original doubts about these electrodes are diminishing. Even though they have not yet reached their true level of usefulness, they exhibit certain advantages which are broadening their niche among welding rods.

Cladding of metals by welding has been accomplished by various unique methods. In one instance, three developments were teamed up for hard surfacing by the submerged arc method.[2] It involved (1) feeding two electrodes through a single head, (2) using an agglomerated flux for alloying the deposit, and (3) oscillating the head to obtain wide, shallow passes. The method features a high deposition rate and economy.

Key to another tough cladding job was the use of submerged series-arc welding.[3] This process involves two rods, with current passing from one rod to the other without the workpiece connected to the welding circuit. Because nearly all the welding power is used in melting the rods, deposition rates are high, yet extensive melting of the base metal does not take place.

MILLION AMPERE machine flash resistance welds entire 40-ft length of pipe in a single operation. Result is a seam as strong as the plate. Machine handles 90 to 100 pipes per hour.

Ultrasonic soldering improves joints

Work on ultrasonic soldering of aluminum had progressed to a point where good, sound joints could be made even on anodized surfaces without the aid of flux.[4] The process applies equally well to sheet, sand castings, diecastings, extrusions, tubing and wire. Aluminum can also be bonded by this method to silver, copper, stainless steel and magnesium.

The usual raft of welding patents were issued on methods, jigs, rods, equipment and other devices. One relates to a novel welding process for welding beryllium-base metals. It involves the use of a shielding gas consisting of 90 to 99½ pct noble gas and from 5 to ½ pct of a fluorochlorohydrocarbon.

Flame cutting developments played an important part in some welding operations. A larger builder of earth moving equipment continued to convert to weldments from casted and riveted structures. The cutting equipment is guided by an electric eye which follows an inexpensive template. Thus, all parts layed out on one large plate can be cut in a continuous operation. The technique eliminates most layout work. Use of the templates also reduces inventory problems, improves production control and allows changes to be made easily.

Powder cutting, too, is assuming a greater position in industrial processing.[5] First developed for stainless steels, the process is now used on cast iron, high-temperature alloys, nickel alloys, copper alloys and aluminum. Uniform powder flow is obtained either with a pneumatic or vibratory dispenser.

THE IRON AGE REFERENCES

1. Welding: Sales Upcurve in Sight, June 3, 1954, p. 81. 2. New Developments Teamed Up to Make High-Quality, Low-Cost Hard Surfacing Deposits, Sept. 2, 1954, p. 103. 3. Series-Arc Welding, Novel Setup Team Up on Tough Cladding Job, Dec. 9, 1954, p. 164. 4. Ultrasonics Improve Soldered Joints in Aluminum, June 24, 1954, p. 97. 5. Powder Processes Solve Tough Metal Removal Problems, July 22, 1954, p. 105.

REVIEW ← → FORECAST

MATERIALS HANDLING

◆ SHIPMENTS of materials handling equipment last year dropped about 15 pct from '53 levels, but outlook for this year is that the industry will make a mild comeback with business running 5 to 10 pct above the '54 pace. Sign of the coming pickup is preliminary fourth quarter '54 shipment figure which is 10 to 12 pct above the previous quarter (low point for the year).

And for the long term it's almost impossible to find a materials handling equipment manufacturer who isn't confident the industry has a gilt-edged future.

Predict faster growth

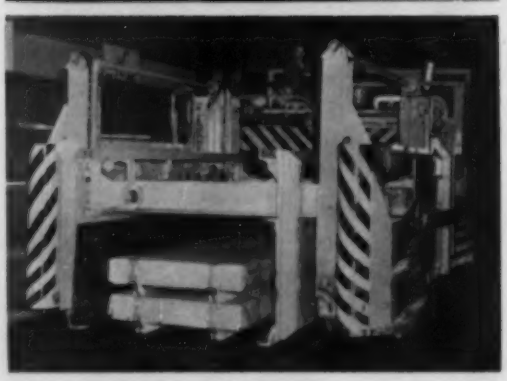
This isn't just tub-thumping either—the industry can point to a record of an 80 pct increase in value of materials handling shipments from 1947 to 1954. And since materials handling is young—didn't get its real start in civilian industry until after World War II—most materials handling experts believe growth in the coming years will be at an even faster pace.

Factors behind last year's decline were the general business recession and cutback in government purchases of materials handling equipment.

Overall, however, the materials handling industry is in extremely good shape and fared considerably better last year than many other capital goods groups. Reason for this is that most manufacturers are now more interested in improving productivity through modernization than they are in increasing capacity.

In the conveyor equipment industry for example, dollar volume of shipments last year dropped to $285 million, down 6 pct from the all-time '53 high of $304 million, but this was still the second best year in conveyor industry history.

The current year is expected to be another "second best" for conveyors with shipments totaling around $300 million. Big projects like the "Carveyor" passenger conveyor belt which will run between New York's Grand Central



TOP
FOUNDRY makes use of this plate-type conveyor arrangement to handle scrap material.

BOTTOM
LARGE straddle carrier handles 15-ft long sheet steel in unit loads up to 30,000 lb.

Station and Times Square and the proposed 103 mile coal-ore conveyor between East Liverpool and Lorain, Ohio, could push the figure to a new high, however.

Pallet manufacturers and industrial truck makers also reported decreased volume last year, but both groups are confident of a strong market in '55.

Sales of wooden pallets varied g r e a t l y throughout 1954 and ended up 10 to 20 pct below '53 figures. Main factor in this decline was the almost complete cutoff of government orders during a good part of the year.

Fast obsolescence helps

If it hadn't been for this cutback, it seems probable pallet makers would have set a new sales record as industrial demand in '54 was equal if not better than in any previous year.

For the current year and the years to come, there are several basic forces that make it certain the materials handling industry will continue to expand. It's obvious that as the population grows and as the gross national product swells to keep pace, more equipment will be needed to move this increased supply of goods.

The high rate of obsolescence is another plus for materials handling market outlook. Since the industry is still comparatively young, many improvements have been made in the last few years. Useful life of many types of handling units is now estimated to be as short as 8 years or less. In line with this a recent survey showed that 28 pct of existing materials handling equipment was not adequate because of obsolescence or poor condition.

The inevitable trend toward automation is another factor that will boom the materials handling industry — particularly conveyors. Also the recently revised tax bill which permits faster writeoff of capital goods should help boost all materials handling equipment sales.

Savings that can be achieved by efficient materials handling systems are frequently spectacular. One large refrigerator manufacturer for example has set up a trolley conveyor system which carries parts directly from the receiving dock to the plant where they circulate around the assembly area until needed.

The manufacturer estimates that this system, as opposed to trucking parts from freight cars, to storage to the production area, saves about 8¢ per refrigerator. With output running around 1.5 million units per year, the saving amounts to about $120,000 annually.

There were no startling new developments in materials handling last year, but there was a continuation of several trends that are becoming increasingly important:

(1) There was growing demand for specialized equipment designed to perform specific materials handling jobs.

(2) Manufacturers have shown a growing tendency to think of materials handling as an integrated system rather than in terms of individual machines.

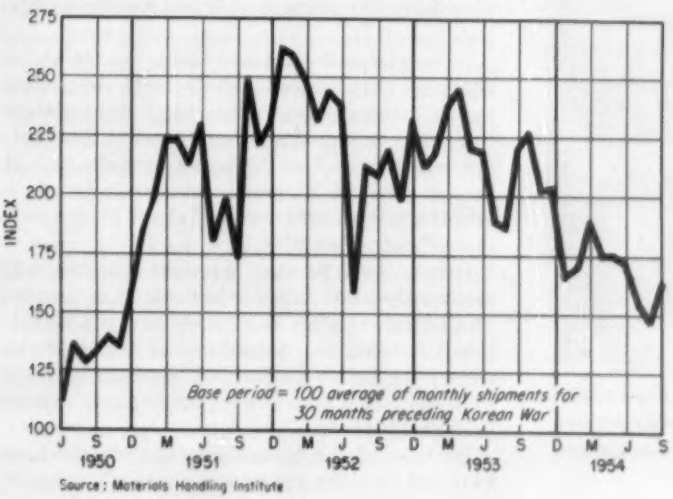
(3) Trend toward increased use of bulk handling methods is still gaining strength.

(4) Pressure is growing to have shipments delivered in palletized loads.

(5) Use of closed circuit TV, two-way radios and telescribers in conjunction with materials handling is still on the rise.

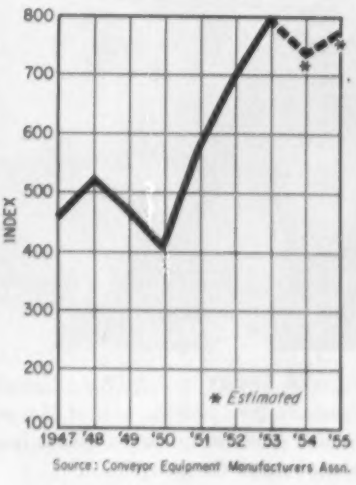
(6) Popularity of equipment leasing plans has grown markedly. And perhaps not too fa off is the prospect that more attention will be given to "people handling." Large plants may put in conveyor belts that will run from distant entrance gates right into the plant. And some may find it advisable to install conveyor belts in the plant itself to carry workers from one place to another.

Shipments of Materials Handling Equipment



Source: Materials Handling Institute

Conveyor Shipments



Source: Conveyor Equipment Manufacturers Assn.

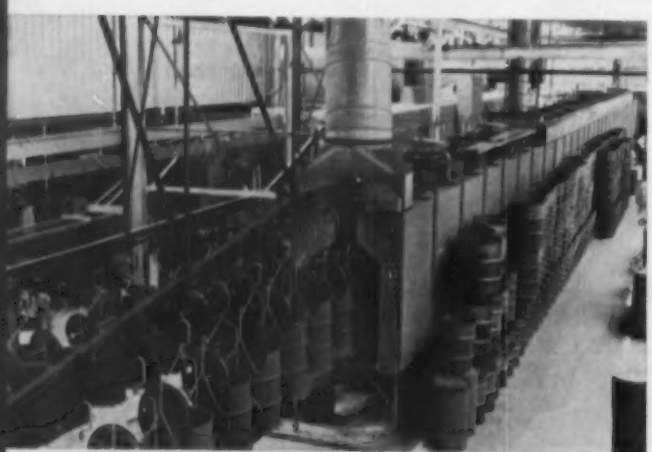
REVIEW ← → FORECAST

METAL FINISHING

◆ WITH OR WITHOUT controls, the nickel picture hadn't changed much as far as platers were concerned. And in Detroit where automakers would normally consume a good share of available nickel, there just wasn't enough for the kind of finishes car makers would like to give the motoring public.

Even though the shortage drew a good many gripes, it has not caused platers to quit trying. On the contrary, they continued to seek out new compounds as suitable substitutes. One approach being taken was through the use of organic compounds added to the plating bath. Other major projects included: development of bright finishes requiring less polishing of the basis material, finishes with better adhesion, study of substitutes for nickel, and means for acquiring greater corrosion resistance.

Early in the year, automakers took the long-range view trying to decide whether to plate trim or use stainless steel. Actually, the latter approach was probably more difficult than the first. The only bright spot in the overall picture was that nickel could be used for trim parts other than bumpers and door handles. While this may help in getting a longer lasting finish on grilles, the picture is far from what automakers would like it to be.



POWER SPRAY WASHER at United States Steel Products Div. plant is one of the world's largest. In nine prefinishing stages, drums are cleaned and phosphatized for spraying.

To compensate for the shortage, researchers have tried various materials and processes. Bright copper plate as a major part of total deposit thickness, followed by a thin nickel coating, has been proposed as a substitute. In some ways, it has helped. In other ways, much was to be desired.

Other substitute finishes such as chrome-plated copper and bright white brass give excellent service for interior applications. For exterior service, particularly in industrial atmosphere, they have not proven too satisfactory. Thus far, there is no satisfactory alternate coating in commercial use that can do the job of a heavy nickel deposit.

In spite of difficulties, platers have made steady gains in getting deposits that are more ductile, have fewer irregularities, and better adherence through improved surface pretreatments. These improvements aren't too apparent to the car buyer, but the fact is that he's getting better plating than he had been.

More plating by automakers

It is noteworthy too that the auto industry is doing more of its own plating.[1] In General Motors alone, Pontiac, Cadillac, Oldsmobile and Chevrolet have installed new facilities during the past year. Cost of the Pontiac bumper plating installation is estimated at about $4 million and is expected to use 50,000 lb of nickel per month. It's just another indication how far automakers will go to get better plating—almost at any cost.

In some applications, tin-nickel alloy plating may provide a satisfactory answer. Although use of this process has not yet attained any commercial significance, its p o t e n t i a l for stretching the nickel supply looks quite promising.

In accelerated corrosion tests, the tin-nickel coatings have proved satisfactory. Long-time exposure tests are now underway. Many platers have already shown a deep interest in this coating which may lead to wider acceptance. If the process is accepted commercially on a larger scale, platers will get about three times the mileage from nickel.

It may well be that tin-nickel plating will assume the same relative position that tin-zinc plating gained after being promoted as a substitute for cadmium. At present, it is considered one of the better processes for acquiring good soldering characteristics, particularly where long shelf life is a problem.

Because of the nickel shortage, researchers have not had the opportunity to push some of

their developments as much as they would have liked. However, one process known for some time, nickel plating from a sulphamate solution, is now taking on greater commercial importance.

The bath features the ability to produce deposits attaining a hardness of about 600 Vhn. The deposits also exhibit low compressive internal stress. Moreover, hardness of the deposit can be controlled. With this combination of advantages, the process is rapidly gaining ground in engineering applications.

Specialized setups more prevalent

On printing plates, hardness and low internal stress of the coating have helped to increase press runs by as much as 50 pct. In rebuilding machine parts, use of hard nickel from a sulphamate bath for most of the coating thickness can actually improve service life of the part substantially. Its use in electroforming has also proven highly satisfactory.

In another field, a new low-cost nickel-phosphorus coating material is claimed to give mild steel the corrosion resistance of some stainless steels.[2] The ingredients of this material consist of nickel oxide, dibasic ammonium phosphate and water, combined to paste, paint or spray consistency. Application of the coating requires no particular skill. It can be applied in any desired thickness to all sizes and shapes of objects.

Hugh sums have been spent in a variety of industries for modern specialized plating equipment which will do the job better, faster and with more accurate control. In many cases, the installations include novel and ingenious work handling mechanisms. Very often the individual processing steps in themselves are not complicated, but the big problem is in blending the separate operations into a smooth flowing production line with little or no manual handling.

In Norris-Thermador's installation at Riverbank Ordnance Plant, many such intricate problems had to be worked out for efficient and high-speed production of zinc-plated steel cartridge cases. More important, the coatings had to meet the most rigid specifications. The plating operation involves 23 separate steps. Work holders were specially designed to thoroughly plate internal surfaces.

Blades balanced by plating

And at United Aircraft's Windsor Locks, Conn., plant, balancing of propellers is achieved by zinc plating.[3] Protection of the hollow steel propellers is the principal reason for plating, but by recycling the blades to increase deposit thickness to a predetermined value, the blades are accurately balanced.

Other engineering features of this setup include: automatic transfer of blades to and from the conveyor, delayed set-down of blades over certain tanks, and automatic bypassing of selected tanks. To conserve water, electric eyes and automatic shutoffs are used at rinse tanks.

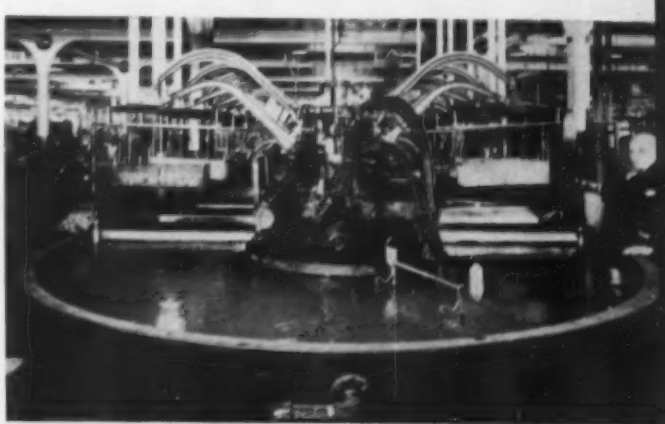
In still another installation at Kenmore Metals Corp., Jersey City, plating of wire is done by spiralling the wire tarough the plating baths.[4] About 900 ft of wire are thus plated in a compact unit occupying only a 30 by 6-ft floor space. The problem of industrial waste disposal continued to be pursued with greater effort than ever. More than 400 individual projects were underway during the past year, of which 131 had been tackled by industry. The remainder were sponsored by private, institutional and governmental agencies.

Many disposal systems have been proposed—some proven highly effective. A recent installation of A. O. Smith's Milwaukee plant, for example, can handle up to 30,000 gal of pickling waste per day at a cost of less than 2¢ per gal. Complete neutralization takes place in less than 15 minutes. After treatment, the waste is perfectly harmless and can be drained into natural streams.

Porcelain enamels resist acids

The trend toward automation and greater consumption of electric power in the home points to a healthy future for the porcelain enamel industry. In the next 7-year period, forecasters are predicting an accumulated production of more than $2.75 billion worth of refrigerators, washing machines and other appliances.

Use of porcelain enamels in industry is also growing. This growth is attributed in large measure to new techniques, and frit compositions of specific formulations which withstand heat, corrosion and thermal shock much more



FULLY-AUTOMATIC plating units of this type have speeded production to new high levels. This Stevens machine uses arms to raise and lower work. Other makes have hydraulic lifts.

New copper anodes minimize sludging, give smoother deposits, increase efficiency . . .

effectively. On cold-rolled steel, coatings can stand repeated shock from 1000° to —60°F. Some industrial enamels resist virtually all acids except hydrofluoric.

Finishing techniques of powder metal parts have been improved to a degree where excellent corrosion resistance, decorative appeal, solderability and conductivity are now obtainable.[5] Finishing is dependent on thorough sealing of internal and external porosity, after which almost any plated finish can be applied. Surfaces can also be prepared by these methods for applying organic finishes.

Among the new products introduced during the past year were new copper anodes which do not require bagging. Called the Anaconda Plus-4 anodes, they are claimed to give complete freedom from sludging. This feature enables deposition of smoother, heavier coatings with greater efficiency.

A new series of phosphoric acid-type cleaners were especially compounded for parts too large or heavy to be treated by conventional methods. These cleaners, the Detrex 800 series, can be applied by brushing, dipping, sponging, or simply flowed on. They can be formulated for special properties as detergency, oil solvency, and rust and scale removal.

Other products make debut

Two new protective coatings for aluminum were introduced by American Chemical Paint Co. Alodine No. 1000 forms an invisible corrosion-resistant finish while No. 1200 provides good protection for unpainted surfaces, and a durable bond for paint finishes. New materials to prevent seizing of titanium fasteners are ready.

A compact filter, using a corrugated stainless steel and wire mesh element and a different type filter bag, is said to give double the filtering area of older type filters. The filter element is easy to replace or clean, cutting down on maintenance time. The new unit was developed by Bart-Messing Corp.

Oakite Products, Inc., added a zinc phosphate coating for iron and steel to its existing line. It is said to produce a zinc phosphate coating of desired weight very rapidly. Coatings are dense and fine-grained. The solution itself has relatively long life and is inhibited for safe use.

Cold cleaners increase safety

Proseal D-36, a new chromate coating for hot dip galvanized surfaces, gives good resistance to white corrosion. Red in color, this liquid product does not discolor galvanized surfaces. In continuous strip mill operation, it resulted in minimum zinc dilution.

Applications for Nickel-Lume bright nickel have been extended by adapting the process to barrel plating. The bath, which is highly stable over long periods of time, forms deposits which need no activation before chrome plating. By adapting the process for barrel plating, many small items can now be plated more efficiently.

A cold cleaner, formulated to increase safety by replacing highly volatile solvents, offers several other important advantages. Used at room temperature, Houghto-Clean 402-403, effectively removes most soils normally encountered in metalworking shops. It also affords protection to clean surfaces between operations or during temporary indoor storage. It is economical and easy to use.

Another cold cleaner, having low toxicity and intended for applications where fire may be a hazard, is Chlorothene which is an inhibited grade of 1,1,1-Trichloroethane. It virtually eliminates corrosion of aluminum, except under very severe conditions.

A new concept in cleaners is incorporated in Pennsalt Cleaner K-8 which is said to have exceptional properties for removing mill oils and smuts from steel and copper prior to electroplating. It provides good electrical conductivity, and is free rinsing.

CONVEYOR lifts parts finished by tumbling to a magnetic separator where they are separated from tumbling media. They are then washed, rinsed and inhibited against rust.

THE IRON AGE REFERENCES

1. Automakers' Plating Research Pays Off, Dec. 9, 1954, p. 120. 2. New Low-Cost Coating Gives Mild Steel Good Corrosion Resistance, Apr. 15, 1954, p. 125. 3. Plating Setup Recycles Propellers for Proper Balance, May 20, 1954, p. 133. 4. Compact Unit Plates Heavy Ductile Coatings on Steel Wire, Nov. 11, 1954, p. 117. 5. New Methods for Finishing Powder Metal Parts, Apr. 1, 1954, p. 125.

INSTRUMENTS

◆ INDUSTRY'S appetite for instrumentation and automatic controls in plants and offices gave instrument makers plenty of cheer during 1954. The potential market for industrial instruments is a strain on the imagination.

Industry has many reasons for turning to instrumentation. Automatic controls have the answer to some important problems. These include a need for better controls to insure quality and uniformity of product; a desire to eliminate human error in high speed operations, and the necessity of reducing costs through automatic operations and minimizing of product rejects.

Higher wage costs are an important factor. This applies to both office and plant. Application of mechanics and electronics to plant and office operations is growing for this reason alone. Automation, along with more efficient machines and equipment, provide one of the few avenues left to reduce production costs in these days of high labor and equipment costs.

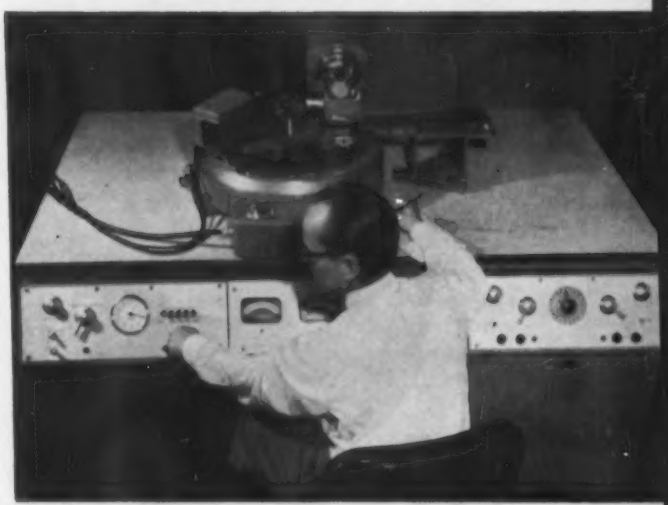
The growing market for instruments was demonstrated in spectacular fashion last September at the first International Instrument Congress and Exposition in Philadelphia. Exhibits of 500 domestic and foreign manufacturers occupied nearly 70,000 sq ft of floor space. More than 250 technical papers were delivered. Registered attendance was just short of 23,000.

Instruments applicable to just about every conceivable operation were on display and aroused considerable interest among engineers.

A growing trend toward digital representation of data was in evidence. Instruments of this type were on display in far greater numbers than in any previous show.

In metal producing and fabricating, in materials handling, and in refractories, use of instruments is a long-established practice. But the growth curve continued upward during 1954. The pages of THE IRON AGE last year carried at least 20 articles describing the application of instruments to production and processing in the metalworking industry.

In a message to the Philadelphia instrument congress, Dr. A. V. Astin, director of the National Bureau of Standards, pointed out that the dependence of industry and commerce on instrumentation and instrumentation techniques "has resulted in a remarkable growth in instrument science and in the instrument industry."



X-RAY fluorescence unit used with other standard chemical analysis methods cuts lab analysis time for iron, chromium and cobalt in highly alloyed metals for jet engines.

"A generation ago," he said, "there were only a few companies in America whose primary concern was with instrument design and manufacture. There are now over 2000 organizations engaged in the instrument business in a major way, and the total annual value of their product is well over a billion dollars.

"There is also increased attention to instrumentation as a special science, as evidenced by the establishment of the Instrument Society of America just about 10 years ago and by its steady growth and increasing activities."

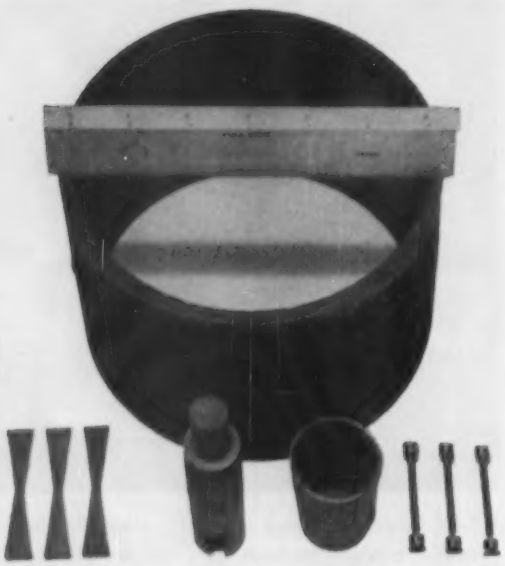
Industry optimism for the future is apparent in predictions that capital outlays for instruments may rise to 15 pct of overall capital equipment expenditures.

THE IRON AGE REFERENCES

Miniature: Tiny Probe Used to Measure High Speed Air Flow, Jan. 14, p. 126. New Instrument Simplifies Diamond Die Inspection, June 10, p. 130. Nuclear Gage Continuously Checks Coating Thickness, Apr. 29, p. 111. Steelmaking: Dust Meter Checks Cleanliness of Blast Furnace Gas, Feb. 11, p. 147. X-ray Fluorescence Cuts Metal Analysis Time, July 15, p. 108.

REVIEW FORECAST

POWDER METALLURGY



NEW BORIDE materials were used to make this mold liner, top, crucible and test pieces.

◆ REFLECTING the letdown in overall industrial activity during the early part of the year, the metal powder industry got off to a slow start during 1954. A good part of the industry's lower volume could be attributed to reduced buying on the part of some of the industry's largest customers, such as defense and automotive manufacturers, in the first three quarters.

Pickup in fourth quarter

Use of iron powder during 1954 dropped 10 pct below the high level of 1953 while copper consumption will probably be lower than that as year end estimates are completed.

Despite the lower volume during the first three quarters of 1954, the industry began to feel an improved demand for its products at the start of the fourth quarter. This coupled with a general upswing in business is hoped to result in a continued moderate gain through 1955.

Users of metal powders are assured of a substantial supply as powder capacity continues to outstrip demand. Entry of Republic Steel Corp.'s iron powder plant, expected at year's end would raise powder capacity to three to four times the level at the beginning of 1953.

More important from the long range point of view is the potential market for the metal powder product. New uses and refinements in processing techniques for all types of powders gave ample evidence during 1954 that the metal powder industry is still in the growing stages.

The automotive industry will be closely watching the progress of powdered iron piston rings. Under development for 2½ years but announced publicly for the first time last year, the powdered iron piston rings have been reported to have passed road tests of 75,000 miles without difficulty.

Improve powder presses

Advantages claimed for this application over cast iron piston rings include 50 pct increase in tensile strength and reduced horsepower losses due to friction (because of the ability to produce a thinner ring through powder metallurgy).

Production of high density parts on a commercial basis gave further promise of widening the market for electrolytic iron during 1954.

In some applications high density powdered iron parts have replaced heat treated steels and outperformed them in accelerated life tests. Among the most favorable uses are gears and cams, where in addition to strength, accuracy, surface finish and shapes are important factors.

Along with the growing requirements of the industry press builders have been improving their products to meet rapidly changing process demands.[1]

Standard presses now available vary from 1½ to 1500 tons. These range from single motion presses to complex five or six motion presses. Depth of fill and parts diameter have increased along with press tonnage.

Multiple motion presses have been a major factor in accounting for a greater overall economy in the powder metal process. Simple, less expensive tools, requiring less setup and maintenance can be used. Compacting costs are reduced because of less press downtime and increased production rates.

Finishing methods for powdered metal parts also being improved. At one company field-testing finishing techniques have been refined

METAL POWDER SHIPMENTS, IMPORTS

SHIPMENTS OF IRON POWDER

Total Net Tons, Four Major Classes*

	Total	Bearings and Parts	Friction Materials	Magnetic Cores	Miscellaneous
1944	1,720	.....	.....	.....	.....
1945	1,950	.....	.....	.....	.....
1946	2,485	1,330	30	415	690
1947	3,115	1,560	30	600	945
1948	3,520	1,685	25	990	820
1949	3,235	1,746	14	935	540
1950	3,942	1,870	23	1,611	738
1951	3,661	2,180	1.5	900	600
1952	4,048	2,109	1.0	336	1,602
1953	6,255	3,457	14.4	1,589	1,109
1954†	7,493	3,250	80.0	913	3,250

* Domestic. † Estimates.

IMPORTS OF IRON POWDERS Net Tons

1948	2,590
1949	3,108
1950	7,607
1951	12,850
1952	5,627
1953	6,964
1954*	5,188

*Estimate

COPPER POWDER SHIPMENTS Net Tons

	Total	Bearings and Parts	Friction Materials	Graphite Metal Brushes	Miscellaneous
1945	6,550	.....	.....	.....	.....
1946	7,380	5,900	560	330	590
1947	8,700	7,170	615	385	600
1948	8,500	6,560	675	575	770
1949	7,014	4,374	1,156	450	1,032
1950	13,109	9,488	1,271	957	1,393
1951	13,571	11,013	963	360	1,205
1952	8,979	6,731	1,081	262	905
1953	11,515	9,281	859	430	944
1954*	9,413	7,159	754	520	980

* Estimate.

to the point where plated powdered metal parts are claimed to be superior in corrosion resistance to metal parts plated by standard methods.

The methods developed are applicable to all powdered metal alloys and parts regardless of the finish desired. Cadmium, zinc, tin, nickel, copper, silver chromium and other finishes can be applied. Thorough cleaning of internal and external porosity are basic to the method.[2]

Direct production of sheet and strip from metal powders remains an intriguing subject because of the powder market possibilities and benefits derived from reducing the number of annealing and rolling operations. Although practical development work on direct powder rolling is making progress in this country, European practice has advanced commercially.

POWDERED iron piston ring, left, cast iron ring right. Muskegon Piston Ring Co. photo.

One plant in Germany is rolling powdered sheet material in copper, phosphor bronze, cupro nickel, bearing alloys as well as bi-metallic strip for bearing, friction and electric contact uses.[3]

Of more immediate market importance to the industry is the growing use of powder welding electrodes and powder cutting and scarfing.

Welds of good quality at lower overall cost substantiate some early claims for the powdered metal electrode. Since welding speeds with powdered electrode are twice as fast as with conventional electrodes, less distortion takes place. Nearly all powdered metal electrodes are made for flat and horizontal welding.

The powder processes first developed for cutting stainless steels are enjoying increasing applications on high temperature alloys, cast iron, bronze, nickel, aluminum and even on concrete and certain refractories.

Improved technique for fabricating the less common metal powders promise to widen demand for these products. In some cases powder metallurgy shows definite advantages in fabricating zirconium, beryllium and titanium.

Since zirconium and beryllium do not behave in the same way during sintering the processing of powdered material to a dense sintered product does not follow the same pattern.[6]

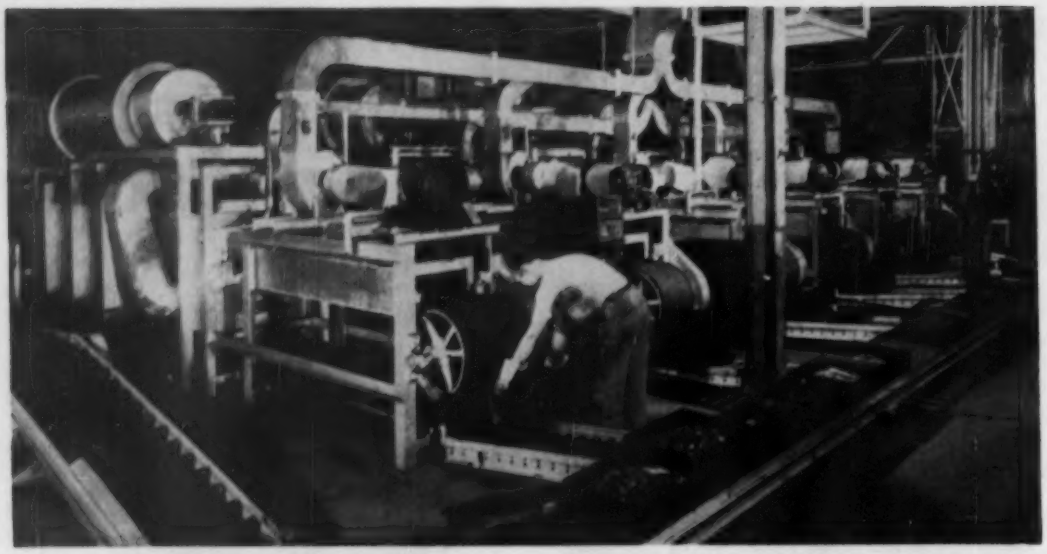
In cold compacting, zirconium sinters to full density at about 600 deg C below the zirconium melting temperature. To obtain full density of beryllium hot pressing is recommended. Zirconium hydride can be compacted at lower pressures than zirconium powder.

Bonded borides of zirconium, chromium and molybdenum, developed to meet specialized defense needs, have engineering properties which were being put to use commercially last year.[4] Zirconium and chromium borides have high melting points, 3000 and 1750 deg C respectively, possess good oxidation resistance and high temperature strength. New applications are for parts operating in molten metals and as a material competitive with carbide for cutting tools.

Hot pressing and press forming are recommended as a solution to some fabricating problems in titanium. In the hot pressing method, high vacuum and temperature are used to prevent gaseous contamination and to remove volatile constituents such as magnesium and magnesium chloride. Press form methods are best suited for quantity, low-cost parts.[5]

THE IRON AGE AND OTHER REFERENCES

1. Powder Press Design Keeps Pace With Industry Needs, Sept. 30, p. 77. 2. New Methods for Finishing Powder Metal Parts, April 1, p. 125. 3. Manufacture of Sheet Metals From Metal Powder, 10th Annual MPA Proceedings, Vol. 1. 4. Borides Designed for High Temperature Use, Apr. 1, p. 138. 5. Hot Press, Press Forming Loom as Answer to Titanium Fabrication, Journal of Metals, Oct. 1954. 6. How to Fabricate Zirconium and Beryllium, Dec. 16, p. 123.



MATERIALS HANDLING equipment, tied in with modern heat treating furnaces, has helped speed movement of fasteners at Elgin, Ill., plant of Shakeproof, Inc., Div. of Illinois Tool Works.

HEAT TREATING

◆ SIGNIFICANT ADVANCES in the design of heat treat equipment coupled with important technological advances have characterized the year 1954. Although not spectacular, the gains made have been important in promoting uniform high quality and improving plant efficiency.

Recent trends in heat treating may be grouped as follows:

1. Closer control of heat treat operations.
2. More effective quenching.
3. Avoiding the use of unnecessary as well as critical alloying elements.
4. Increased use of induction and salt bath heating.
5. Selecting steel composition, atmosphere, quenching temperature and quenching medium to minimize distortion and reduce or eliminate straightening and machining operations.

The technological gains made have occurred on a wide front: in carburizing, carbo-nitriding and salt bath hardening. Simultaneously, the use of fast, scaleless induction heating has found a number of new, unusual applications.

Better understanding of the principles of heat treating, coupled with improved control devices and new facilities for automatic handling of parts, have resulted in greater production of parts to increasingly restrictive specifications, often at lower cost.

The use of oils having greater quenching power and improved facilities for agitating the quenching bath has made it possible to specify steels having somewhat lower hardenability than the grades previously used.

Also, serious consideration has been given to the conservation of alloying elements which would be in a critical national emergency.

More hot oil quenching

Controlled carbon restoration to decarburized areas and the use of a comparatively low carbon case for carburized parts is more generally accepted today than formerly. Increased use of hot oil and hot salt quenching, often with strong agitation, has been apparent. Use of pit type annealing furnaces, particularly in small commercial establishments, with controlled atmospheres has been increasing.

While boron steels received considerable attention during World War II and immediately after the close of hostilities, their limitations for carburizing applications have evidently resulted in severely curtailed use of these steels. Indeed, new or further applications of boron

steels were scarcely mentioned during last year.

The concept that steels are 100 pct equivalent if their hardenabilities are equivalent is being examined critically by some metallurgists. Their present view seems to be that steels having the same hardenability are much, but not entirely alike. The problem seems to be to find out what subtle differences there may be between steels having identical hardenability.

Increase salt bath use

New attempts are being made to utilize salt baths for heating steel forging blanks. Development of the submerged electrode salt bath has encouraged this development. A more recent approach involves the use of gas or oil in a special heating chamber mounted over a portion of the salt bath surface. There is evidence of increased use of salt baths both for austempering and martempering.

If the dew point of a furnace is controlled, it is possible to carburize steel within very close limits. Dew point control has been the basis of considerable research during 1954.

Developing ability to generate gas of a desired composition, finding a way to measure this composition accurately and quickly and providing a means of automatic control has been an object of intensive study during recent years. The search is not ended but substantial progress has already been made. The day when the heat treater can control his operations within very close limits simply by turning a few dials is not far off—if it is not already here.

Hot oil quenching in sealed tanks is increasing. Quenching from a sealed vestibule facilitates control of the operation conserves oil and promotes cleanliness. Hot oil quenching can be adapted to most carbonitriding deep case hardening as well as through hardening operations.

As in other metalworking departments, automation is playing an increasingly important role in heat treating. Unnecessary handling of parts has been eliminated. Mechanical handling is replacing manual handling. The growing use of enclosed quench baths has required the development of ingenious mechanical handling devices. The trend toward automatic handling is certain to continue.

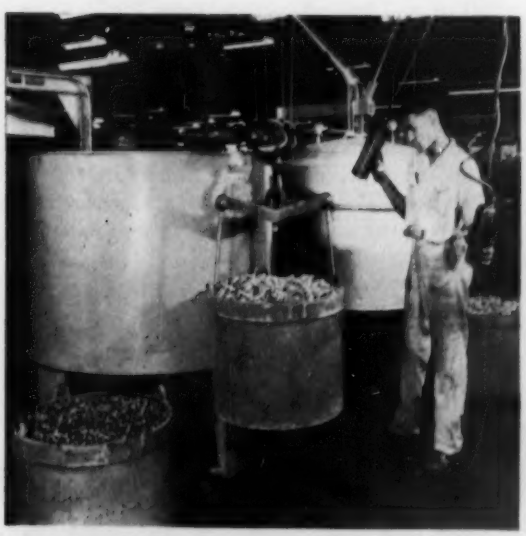
Much has been accomplished in recent years in clarifying and confirming the hardenability concept. Wide acceptance of the principles of hardenability have undoubtedly greatly simplified the metallurgists' understanding of heat treat phenomena.

New carburizing steel

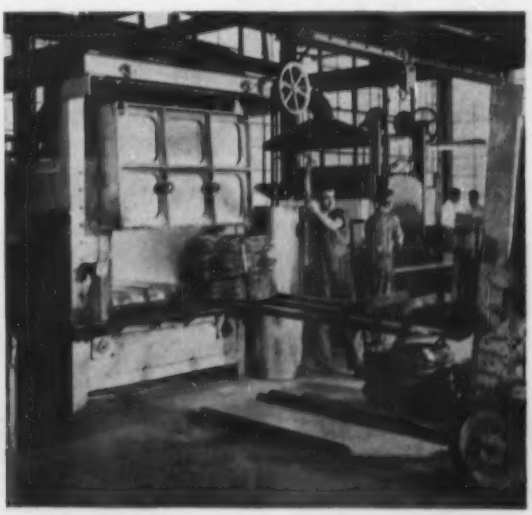
The subject of hardenability continues to interest the progressive heat treater. During the past several years, considerable hardenability work has been directed to carburizin grades of steel. At the moment, data which will permit correlation of hardness, structure, etc., at the various carbon levels is still needed.

Use of hardenability data on tempered end quenched bars is expected to increase.

A significant recent development is a new carburizing steel, containing about ½ pct molybdenum and ½ pct manganese, designed to produce high case hardness with minimum distortion on quenching. Several heats have already been used with considerable success. No tendency to retain excessive amounts of austen-



CAST IRON parts and high speed steel tools are steam drawn in this Leeds & Northrup unit. Steam drawing is used to improve lubricating properties in the production of cast iron parts.



PIER ARRANGEMENT of Surface Combustion Corp. oven hearth at H. M. Harper Co. plant, Morton Grove, Ill., permits rapid charging and discharging of both baskets and coils.

"Plant metallurgists are moving away from double heat treatment wherever possible . . ."

ite on quenching have been observed to date.

Metallurgists are constantly finding new and better ways to control operations. A simple test is now available showing the quenching power of salt baths. An eccentric hardenability test specimen is the basis for the test. Objective of the test is, of course, to determine the effects of various degrees of agitation on the quenching power of salt baths.

Hardness readings are taken at 5 locations and plotted against varying section thickness. Test studies recently completed indicate that the quenching power of still salt may be increased several hundred per cent by proper agitation. Similarly, violent agitation of oil may increase its quenching power as much as 3½ times while the H value of agitated brine is 2½ times that of still brine.[1]

Another useful tool for the metallurgist is the crackability bar developed by Chrysler Corp. metallurgists to predict susceptibility to cracking. Tests made thus far indicate that cracking of steel parts may be more related to carbon content than to hardenability. Laboratory tests show it is relatively difficult to crack a low carbon steel bar, for example, while higher carbon grades can be readily cracked if a severe enough quench is employed.

In many high production plants, carbon content of the case is being held at relatively low and close levels (under 1.0 pct and within 5 points). Tests indicate that case carbon of 1 pct and under is desirable to produce optimum serviceability. Some large automotive plants regularly hold carbon content of the case within the range 0.85 — 0.90 pct. Low carbon content of the case gives increased hardenability and higher hardness, resulting in part from a decreased tendency to retain austenite.

It appears that plant metallurgists are moving away from double heat treatments, wherever possible. The present approach seems to be, wherever practical, to carburize at a suitable temperature, then drop to a lower temperature, say 1550°F. This temperature is high enough to hold the comparatively sluggish case in solution and, at the same time, produce the desired structure and hardness. Use of a low quenching temperature minimizes distortion and also avoids undesirable carbon precipitation.

Although limited in commercial application, low carbon steel can sometimes be substituted for high carbon steel in forged parts. After forming, the parts are through carburized under accurate control. Use of low carbon steel simplifies fabrication. The through carburizing treatment provides the carbon needed to develop the desired physical properties.[2]

Close attention to operating conditions may sometimes lead to profitable improvements in methods. For example, by substituting a free fall quench in a salt bath for a basket quench, the time required for a quenching operation was reduced as much as 40 pct. Previously, parts were placed in a basket for immersion in the salt bath. The basket absorbed much of the heat, requiring longer immersion of the parts.[3]

The usefulness of cast iron as an engineering material has been extended by the use of modern heat treating methods. Using modern equipment, graphite can now be closely and desirably controlled. Simultaneously, internal stress is relieved and ductility, toughness and hardness can be improved. A choice of highly effective heat treatments is available, including stress relief anneal, quench, draw, interrupted quench and surface hardening.[4]

Induction heating gains

Important gains in the use of induction heating have been made in recent years. By combining fast, closely controlled electric heating with automatic handling devices, new production records for high quality parts have been established. Induction heating, in addition to its remarkable speed and flexibility, permits scaleless heating. For many applications, plain carbon steel may be substituted for alloy grades. The trend toward induction heating, particularly in large volume plants, is increasing.

Intelligent planning can convert a heat treat layout into a remarkably flexible operation. For example, using 5 gas-fired, batch-type furnaces, one company was able to heat treat more than 7,000 types and sizes of precision, alloy fasteners. Up to 50 tons of assorted groups of fasteners are processed each week. Both standard and special heat treat cycles are carried out in these furnaces. Nonferrous as well as steel parts are processed regularly.[5]

THE IRON AGE REFERENCES

1. Simple Test Measures Quenching Power of Salt Baths, Apr. 8, p. 154. 2. Through-Carburizing Simplifies Production of Formed Parts, July 22, p. 115. 3. Free Fall Quench Cuts Solution Heat Treat Costs, May 13, p. 134. 4. How Heat Treating Improves Modern High Strength Irons, June 10, p. 125. 5. Versatility—Key to Efficient Heat Treat Layout, Mar. 25, p. 148.

TESTING AND INSPECTION

REVIEW FORECAST

◆ WIDE DEVELOPMENT of improved testing methods and equipment have resulted from industry's growing acceptance of automatic processing and the need for greater accuracy in a broader range of industrial activity. Industry generally is placing greater reliance on electronic devices in testing.

Topping the list of industry needs has been inspection and gaging equipment which can be integrated with high speed machinery and automated production lines. In the production of basic materials, in machining, forging, grinding, plating and other metalworking operations, industry needs gaging devices which can pace high speed processes and machines. Such instruments, to permit utilization of the productive potential of high speed machinery, must be capable not only of measuring to a high degree of accuracy but must also be designed to feed data to adjusting devices which will automatically compensate for fluctuations within the processing cycle.

More built-in gaging

Gage and instrument makers have met these needs with highly effective instrumentation. Modern gaging and control devices, on the basis of one or several simultaneous measurements, are designed to call attention by alarm systems to variations from the norm or to compensate for changes in the working cycle.[1]

More and more gaging devices are built in automatic machine tools, transfer lines, and processing equipment. These devices warn of approaching out-of-tolerance conditions and automatically reject faulty parts. High speed automated machinery can be automatically stopped when too many parts come over or under size.

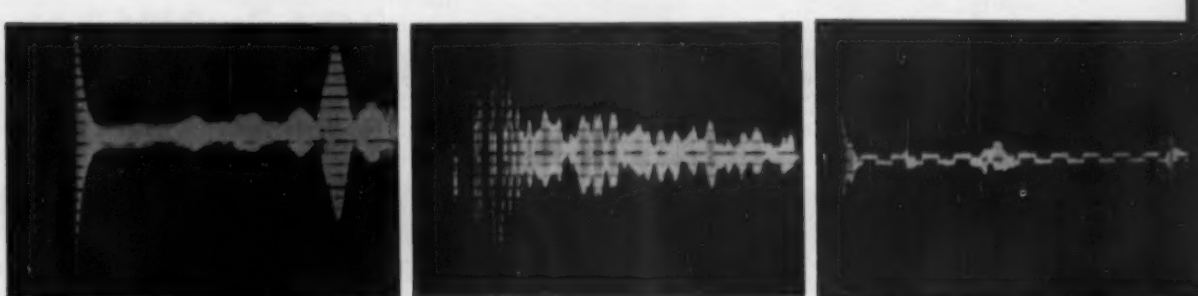
The trend to wider use of nondestructive testing continued during 1954. This trend can be expected to continue in the future. The concept of nondestructive testing now encompasses all steps from receipt of material through complete fabrication of the part. The concept is being applied more widely to fabricating processes.

Typical of the development of nondestructive testing devices are new instruments which utilize basic electrical properties of materials. These new instruments are capable of checking metal analysis, measuring plating thickness, sorting materials, checking hardness or case depth, detect flaws, cracks and internal voids. Generally these instruments involve wider application of electronic devices to testing.

Two such instruments,[2] a metals comparator and a magnetic comparator, designed to conserve metals and reduce manufacturing costs, compare electrical or magnetic properties of test pieces with those of a known standard. The degree of variation in these properties is correlated with known physical or chemical properties of the specimen being tested. Both instruments can be used on ferrous and nonferrous metals.

Another electronic device designed for sorting metal stocks and measuring plating thickness is the Thermoelectric Metal Comparator. The device provides a nondestructive test for quickly and accurately sorting mixed metals. Closer control of metal chemistry at the mill may also be possible with the instrument. Thicknesses of foil and nonconductive films can be measured.[3]

Three new electronic devices have been developed by the National Bureau of Standards to measure thickness of plated metal. All depend upon the difference in electrical conductivity between the plated and base metals and permit simple nondestructive testing.



INNER STRUCTURE of forging ingots may be readily determined by ultrasonic testing. A Sperry Reflectoscope, used at Allis Chalmers Mfg. Co., shows sound ingot, left; ingot with center porosity and secondary pipe, center; and structure of shaft made from sound ingot.

RAPID TESTING for material in small parts can be done on a production basis with the Thermoelectric Metals Comparator developed in the Research Laboratories of General Motors Corp.

Industry is making greater use of isotopic materials in gaging devices and in radiographic inspection. Use of such materials is expanding rapidly as industry gains greater knowledge of the specialized techniques required.

Test blanks before forging

Typical of the family of gaging devices which have put fission products to work is one which continuously measures the thickness of zinc coatings on galvanized sheet. The gage measures coating thickness along the length of the strip, across its width and on both sides.[4]

Working on their own many companies have developed both equipment and techniques which permit wider utilization of radiography and eliminate radiation hazards to personnel. At the same time, equipment makers have come up with new small units which permit nondestructive radiography at low cost. Rays from the radioactive source material in some of these portable units can penetrate 8 in. of steel to produce an X-ray type picture of inner metal structure.

X-ray fluorescence, used in combination with other standard chemical analysis methods, can sharply cut laboratory analysis time. Routine analyses for iron, chromium and cobalt in highly alloyed metals are being made by this method. Standard curves obtained from samples of known analysis are used as a basis for comparison. Where wet analysis for iron and chromium would require 2½ hours, analysis can now be done in 45 minutes.

Ultrasonic testing, used to determine soundness of forging blanks, *before forging* has helped cut the cost of finished forgings. The test applied to large forging ingots, is rapid, reliable and inexpensive. The sonic test data is used to aid in positioning forgings in the ingot, check ingot soundness and predetermine forging procedure. In extreme cases, an ingot can be scrapped before any forging time is expended.[5]

A vacuum-tin-fusion method of analysis for hydrogen, developed at United States Steel Research and Development Laboratory, shows promise of being fast enough and accurate enough to study hydrogen during steelmaking. The method, recently improved, permits analysis of gases evolved from a steel sample for hydrogen by means of a thermal conductivity cell. The analysis requires about 15 minuates and is accurate to plus or minus 0.12 parts per million.

Improved drop weight test

Static balancing of fans, helicopter rotors and other rotating parts is being done faster and more accurately with a newly developed vertical balancing rod to which strain gages are bonded. The rod supports parts to be balanced. Unbalance is detected by bending strains in the rod.

An improved drop weight test for measurement of notch ductility has been developed. Applied to nodular iron, the test has proved useful to both producer and buyer of castings. The test is based on sensitivity of notched materials to brittle fracture at lower temperatures. Point of nil ductility can be quickly located within a narrow temperature range.

Another application of electronics to testing is the stress-rupture test used by one company to assure high quality in turbine blades which operate under high heats and stress. Under controlled heat and weight, specimens are stressed to the rupture point while the increasing strains are studied electronically. Thermocouple wires attached to the alloy test specimen take the "pulse" of the metal while under temperatures from 1200° to 1500°F and loads to 65,000 psi.

Determine particle size

An important step forward in the control of finely divided materials such as powdered metals, fine abrasives, etc., is the development of an instrument for determining particle size distribution quickly and accurately. Particle size distribution for particles ranging from 1 to 250 microns may be rapidly determined with the Micromerograph. Complete and more accurate analyses may be obtained in a matter of minutes compared with other methods.

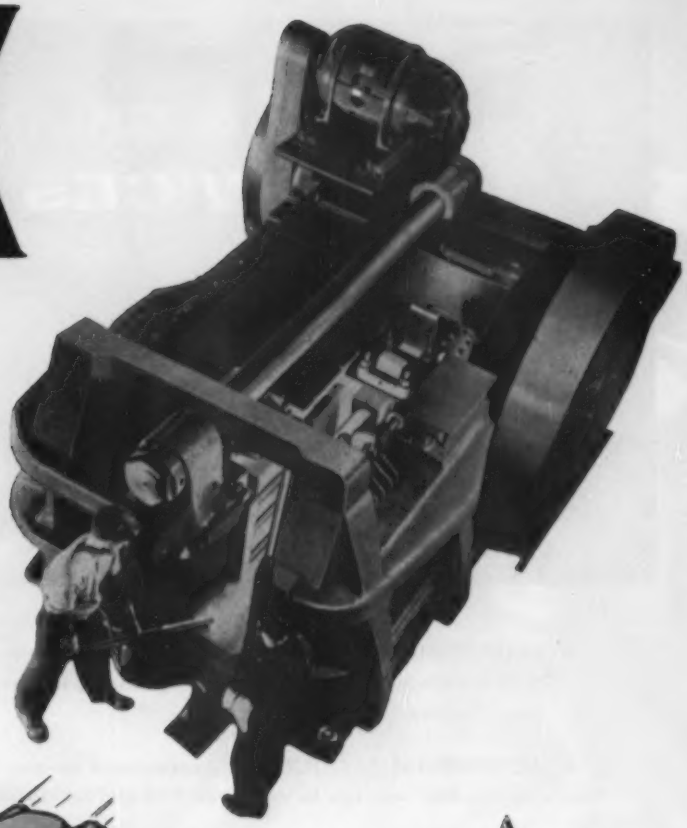
A rapid nondestructive test method has been developed to determine percentages of austenite and martensite in fine stainless steel wire. The method combining both magnetic test and X-ray diffraction techniques, was developed to obtain data not easily obtained using standard metallographic methods.

THE IRON AGE REFERENCES

1. Built-In Gaging Parallels Automation Growth, Oct. 21, p. 234. 2. Electric Units Make Fast Check On Part Quality, Apr. 29, p. 89. 3. New Device Sorts Metals Accurately, Quickly, Mar. 4, p. 162. 4. Gaging: Electronic Devices Gage Metal Coating Thickness, Aug. 19, p. 152. 5. Ultrasonic Testing Lowers Forging Production Costs, May 13, p. 117.

AJAX

FORGING MACHINERY



FORGING
BETTER PARTS
FOR TODAY'S
FINE CARS

A
Complete Line
of
FORGING PRESSES
FORGING MACHINES
and
FORGING ROLLS
To Meet The Needs
of
The Forging Industry

— write for Descriptive Literature —

THE *Ajax* MANUFACTURING CO.

EUCLID BRANCH P. O.
CLEVELAND 17, OHIO

110 S. Dearborn St.
CHICAGO 3, ILL.

W. P. WOOLDRIDGE CO.
1209 Burlingame Ave.
BURLINGAME, CALIF.

6440 Fleet St.
LOS ANGELES 22, CALIF.

Dewart Building
NEW LONDON, CONN.

- **SALES ENGINEERING** . . . engineers and production men draw on extensive experience and up-to-date knowledge to recommend money-making lathe techniques, backed up with production and cost estimates.
- **EXPERIMENTAL FACILITIES** . . . concentrated on new lathe and FLOTURN development proving "impossible" jobs can be done with time and money saved!
- **TOOLING** . . . lathe tooling experts develop the most efficient tooling for better results, lowest cost production.
- **DEMONSTRATION ROOM** . . . a big "showroom," with representative lathes, where you can see your part turned on Lodge & Shipley Lathes or produced by FLOTURN, proving estimated time and cost figures.
- **TRAINING** . . . expert demonstrators are available to provide in-your-plant operator training.
- **MANUALS** . . . exceptionally complete operator's manuals minutely detail every step in the proper installation and operation of your Lodge & Shipley Lathes.
- **SLIDE FILMS** . . . detailed presentation of Lodge & Shipley Lathe features and what they mean in accuracy, productivity, low-cost operation.
- **MOVIE** . . . new, color-sound 16mm film reveals Lodge & Shipley services and facilities. (Available soon.)
- **LITERATURE** . . . objective-type bulletins on all Lodge & Shipley Lathes plus a long series of case histories detailing results.

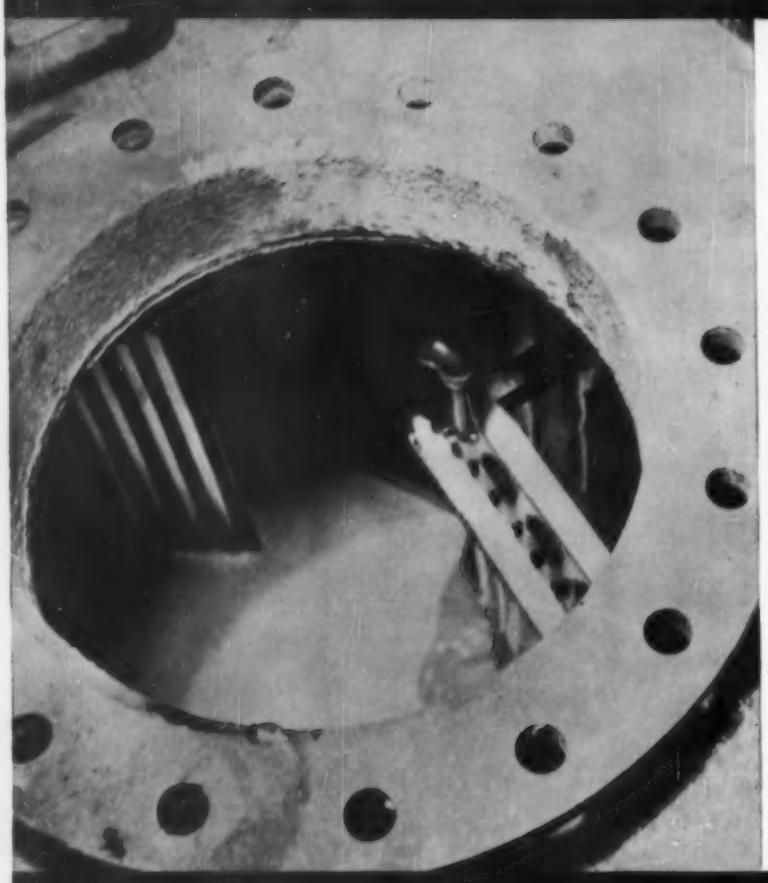
Here's help in doing lathe jobs better, faster and at lower cost! A wide range of valuable services—many of them free—all designed to help the lathe user solve his production problems. For more information without obligation on any of the above services, write today to:

THE Lodge & Shipley COMPANY 3055 Colerain Ave., Cincinnati 25, Ohio.

Bright as tomorrow!–Right for the years!
SUPERIOR
stainless strip steel
The sparkle that catches the car buyer's eye is a *permanent* pleasure with Superior Stainless. Time can't dull the brightwork made of this solid-bright metal. Superior Stainless Strip Steel is the dress-up feature that helps make the sale —and through superior performance, helps keep each owner sold. • Let us give you the facts on fabricating ease, gauges, tempers, finishes and coil widths for your needs.
Superior Steel
CORPORATION
CARNEGIE, PENNSYLVANIA

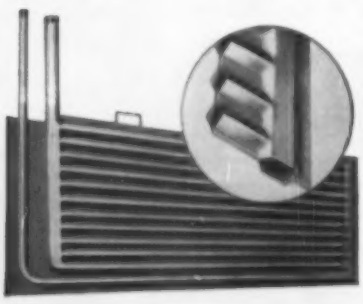
new PLATECOILS®

cost less than pipe coil repairs...



as Coil-itis* is cured in this Sherwin-Williams agitated tank

Platecoils have replaced a large circular pipe coil formerly used to cool alkaline slurry in an agitated tank at Sherwin-Williams Company. Installed on end, Platecoils are inserted or withdrawn through a manhole on the top of the tank. With pipe coils, it was necessary to remove the motor and agitator and the bolted-down tank top to make repairs. Cost of doing this just once exceeded the total cost of the 6 Tranter Platecoils now used. In addition, cooling is now accomplished without fouling of surface, which means the cooling is more effective and maintenance is decreased. Such outstanding savings are possible with Platecoils. Investigate them for your processes today. For heating as well as cooling, Tranter Platecoils are your best answer.



PLATECOILS *replace pipe coil for 50% of the cost*

*Besides reducing original costs, Tranter Platecoils frequently save 50% in maintenance costs. And production time is saved because Platecoils heat or cool 50% faster and payloads are increased because Platecoils take 50% less tank space. By overcoming the limitations of old-fashioned pipe coils, Platecoils cure Coil-itis.

Write today for a 12-company report on savings made by use of Tranter Platecoils. Ask for Bulletin No. P73.

PLATECOIL Div. TRANTER MANUFACTURING, Inc., Lansing 4, Michigan

Report To Management

Just Like '54—Only Better

You can figure the economy's headed for another second best year. Business can't miss being better than it was in '54 and there's a chance the current uptrend could make '55 the best year ever, topping even record prosperous '53.

If you check all the indicators economists customarily rely on, you'll see that statistically we're just about where we were a year ago, maybe a little ahead. Big difference now is that most of the charts are uptrending from the recession low-point reached last spring, while a year ago the indexes were moving down.

What's the Difference Now?

Big factors in the much overrated '54 recession were inventory cutbacks and the impact of reduced defense spending. As we enter '55 the inventory situation is the exact opposite. Manufacturers went too far in cutting inventories last year and now most firms are trying to build up depleted stocks and take care of an increasing volume of new orders at the same time. It means there'll be a lot of business for almost everyone.

The change in defense spending isn't so dramatic, but you can figure defense outlays through '55 will be little heavier than they were last year. Certainly the economy won't have to adjust to the shock of sudden government spending cuts the way it did in '54.

When you couple these facts along with the prospect that consumer spending will probably be even higher than it was last year, the outlook is extremely optimistic. Don't forget that despite all the recession talk '54 was a very good year. 1955 will be even better.

Here's What to Expect in '55

In making your plans for '55, these are the important trends to watch:

Steel: Headed for a very good year. Production will be up between 100-106 million tons from '54's 88.3 million ton level.

Construction: Will continue to be a bulwark for the economy; activity will be 8-10 pct better than it was in record '54.

Automotive: Will be solid with production, perhaps topping 5.8 million cars compared with this year's 5.5 million.

New Plant and Equipment Expenditures: Will continue in slight decline but not so bad as generally predicted.

Railroads: Not headed for a great year but can't miss being better than '54. Railroad buying will be up—could surprise a lot of the experts.

Stock Market: Will gain slightly, but rise won't be as spectacular as in '54. Stability is keynote here.

Labor: Look for slightly longer workweek, more overtime, continued wage gains. Odds are against a steel strike, same for automotive, though this is a touchier situation. Guaranteed annual wage horn will be blown harder than ever, but unions will again trade this issue for a wage increase. Total employment will be up slightly over '54 average. Unemployment will be up over current level during part of '55, but average for year will be considerably lower than in '54.

People: Will earn more than in '54 and will spend more. Watch for pickup in expenditures for durable goods.

Retail Sales: Will be very good, could be more than 4 pct above '54 levels.

Taxes: Any reduction for business firms is out. Chance of a tax cut for John Q. is slightly better but still does not seem likely for '55.

Prices: Despite fact that we are in a slightly inflationary period, prices will remain remarkably stable. Will be up slightly from '54.

All in all it adds up to another extremely prosperous year for the U. S.

INDUSTRIAL BRIEFS

Congrats . . . National Broach & Machine Co. is celebrating 25 years of operation. The company sells gear finishing and inspection machines and allied tools as well as broaches to American metalworking manufacturers, and metalworking plants making gears in every industrialized foreign nation in the world.

Jet Research Center . . . Westinghouse Electric Corp. plans to build a jet engine research and development center at its Kansas City plant.

Scholarship . . . The National Open Hearth Committee of the American Institute of Metallurgical Engineers has established an annual scholarship in the Dept. of Metallurgy at Carnegie Institute of Technology, Pittsburgh.

Back In Service . . . Newport Steel Corp., Newport, Ky. has put three open hearth furnaces back into service. The increased operation will require the recall to work of approximately 100 employees.

Prexy Elected . . . The Material Handling Institute Inc. has elected R. H. Davies president. Mr. Davies is vice-president of the Industrial Truck Div., Clark Equipment Co., Battle Creek, Mich.

Expansion Planned . . . Atlantic Steel Co., Atlanta, plans to increase its Warehouse Div. by 50 pct.

Enlarges Territory . . . Enthone, Inc., New Haven, Conn., has assigned additional territory to its Chicago manufacturing distributor, Ardco Inc. The company will now service southern Illinois and eastern Michigan.

Well Deserved . . . Employees of the Brier Hill Works of The Youngstown Sheet & Tube Co. were honored earlier this month for working 3,291,600 consecutive hours without a compensable injury—a new company safety record.

Elected . . . Joseph H. MacNaughton, treasurer, Universal Match Corp., St. Louis, and John E. Sullivan, controller-assistant treasurer, Acme Aluminum Alloys, Inc., Dayton, have been elected to membership in the Controllers Institute of America.

Distributor Named . . . The Parker Appliance Co. has appointed Keystone Pipe & Supply Co., 3232 W. Fond du Lac Ave., Milwaukee, as a distributor for Parker tube and hose fittings and related products.

New Moniker . . . Daubert Chemical Co. is the new name of the former Nox-Rust Chemical Corp. in Chicago. The name was changed because of the company's diversification of products.

Repeated by request.

"At the slightest touch of the accelerator the Whizzer 8 leaps forward with irresistible power. Over hill . . . down dell . . . the countryside flashes by in one vast panorama of farms, forests, fields and foliage. Three-hundred and eighty wild, eager, impatient horses beneath the hood straining at their bits to be off. You'll love the thrilling power . . . the ever-changing scene . . . the . . ."

Elected . . . Wayne Rising, vice-president, Ducommun Metals & Supply Co., Los Angeles, was elected president, National Assn. of Aluminum Distributors at the annual meeting in Boca Raton, Fla.

Will Merge . . . The Pennsylvania Crusher Co., a wholly-owned subsidiary of Bath Iron Works Corp. since 1947, will be merged with the parent company on Dec. 31. It will be known as Pennsylvania Crusher Div. of the parent company.

New Plant . . . Southern Screw Co., Statesville, N. C., will begin production early in 1955 on a new building. The new plant first in a $2 million expansion program will almost double the company's present space and will provide for 600 to 800 employees.

Dividend Declared . . . Giddings & Lewis Machine Tool Co., Fond du Lac, Wis., has increased the quarterly dividend of 40¢ per share to 50¢ per share and in addition declared an extra of 30¢ per share on the outstanding common stock. Both of these were payable Dec. 27 to stockholders of record Dec. 17.

Nearly Completed . . . Construction work is nearing completion on an expansion of the Bristol Co., manufacturing plant in Waterbury, Conn. Heat treating facilities at the plant have also been recently increased to process a much larger volume of instrument parts and socket screws.

Trucks Purchased . . . General Motors Corp. Truck & Coach Div. reports that a total of 220 GMC dump trucks involving contracts of more than a million dollars, have been purchased by two eastern states for highway maintenance.

for transportation equipment

that stands up...

FLAT-ROLLED STEEL

produced by a specialist

The kids who roll down Oak Hill in a coaster wagon, and those of us who ride in the world's best automobiles, put a lot of faith in flat-rolled steel.

If you use flat-rolled steel in your products, rely on a specialist—Great Lakes Steel. Our entire organization is devoted to the business of making more and better flat-rolled steel for every application. Many manufacturers have found we have some unique qualifications to help them to improve products and reduce costs. We would like the opportunity to work with you on your problems.

Call on our 25 years of specialization in flat-rolled products. Our representative will be glad to discuss your particular needs at your request.

Great Lakes Steel
Ecorse, Detroit 29, Michigan
PRODUCER OF H-A-T HIGH-TENSILE STEEL

UNIT OF NATIONAL STEEL CORPORATION

SALES OFFICES IN CHICAGO, CLEVELAND, GRAND RAPIDS, INDIANAPOLIS, LANSING, NEW YORK AND PHILADELPHIA

REVIEW FORECAST

Shakeout Over, Optimistic on 1955

Mergers were top automotive development of '54 . . . Chrysler restyling notable . . . Big question mark in '55 is labor—could upset all predictions . . . See 5.8 million car year—By *R. D. Raddant.*

◆ MANY AN AUTOMAKER must have felt like Father Time as the end of 1954 rolled around. A year of unusual trials and tribulations, it added a lot of gray to executive heads and a little more stoop to management shoulders.

In contrast, 1955 holds out the prospect of good business with only the normal challenges of competition and one big question mark in labor as the chief obstacles to good production figures and black balances.

Looking back over the past 12 months, a number of events stand out. Of particular importance was the consolidation of independents, reducing the ranks of companies from eight to six. This was accomplished by the formation of American Motors through the merger of Nash and Hudson and the union of the two remaining independents into the Studebaker-Packard Corp.

History's Biggest Change . . . Next was the year-long program of Chrysler Corp. which accomplished perhaps the biggest model change in history. It literally pulled itself up from a rather serious position to a firm stance from which it can view 1955 with every feeling of confidence.

Although still experimental, the appearance of gas turbine-powered cars marked a big engineering stride. GM produced its Firebird showcar and a turbine-powered bus. Chrysler had the only turbine-powered passenger car, a Plymouth that showed good performance and creditable economy.

The no quarter battle between the two giant divisions of Ford and Chevrolet could not be ignored. With first place in doubt right up to tabulation of registrations, the accompanying effects of the battle were considered by many authorities to be the most significant factors in disturbing the industry's normal balance.

Independents Will Push . . . And disturbed it was. In a year when total sales were among the top four in history, the industry was sharply divided between the princes and the paupers. The attempts of the paupers to clothe themselves with some of the shiny profits of the others will highlight the sales picture during 1955.

In short, the questions to be answered regarding competition are these: Can Chrysler's new lines restore it to its former position as a sturdy member of the Big Three? Can consolidation of independents result in the integration permitting them to stand successfully against the bigger competitors?

There is a non-competitive factor lurking ahead that could be the old equalizer. An extended strike at any of the producers at the expiration of 5-year labor contracts with the United Automobile Workers could upset all predictions.

Labor Could Call Turn . . . Walter Reuther has never varied from his determination to win a guaranteed annual wage. After 5 years of real labor peace, contract expirations bring the issue to a showdown.

In addition to a guaranteed wage, the UAW will ask for increased pensions, at least 10¢-per-hour wage boosts, increased annual improvement factor, upward adjustments in escalator provisions, and health and hospitalization measures.

The auto industry singly and collectively has remained tight lipped and few predictions are heard from any source. Almost any prediction made at this time is sure to look bad when the smoke clears away sometime next spring or summer.

Most discussed possibility is that a token gesture will be made in the direction of assured em-

	1954*	1953
U. S. Cars	5,505,000	6,134,534
U. S. Trucks	1,010,000	1,203,835
Canada Cars	280,000	366,535
Canada Trucks	66,000	117,236

* Estimated

Source: Ward's Reports

All field connections in new Equitable skyscraper are made with RB&W high-strength bolts!

First San Francisco skyscraper to go up since adoption of the city's strict 1948 earthquake code, the new 25-story Equitable Life Assurance Society building features a unique design of tapered steel columns and butterfly-shaped spandrel beams in outside walls.

A landmark in architectural design, the structure also makes news on another count — all field connections are made with RB&W high-tensile-strength bolts.

This proven fastening technique provides greater strength (important in dealing with earthquakes!) at less actual cost. And the faster installation it permits often slices erection time by weeks!

An important installation like this underlines the fast-growing acceptance of high-strength bolting for tough jobs that place a premium on speed and strength. Find out why RB&W is in the lead in this technique by writing for our catalog, "High-Strength Bolts for Structural Steel Connections." 4-32A

CLOSE-UP of RB&W high-strength bolts in Equitable's new skyscraper. Architects: Loubet & Glynn Associates and W. D. Peugh; Irwin Clavan, consulting. Gen'l contractor: Dinwiddie Construction Co., San Francisco. Steel erector: Consolidated Western Steel Div., U. S. Steel Corp.

See our insert on high-strength bolts in Sweet's Architectural File

RB&W RUSSELL, BURDSALL & WARD

109 YEARS MAKING STRONG THE THINGS THAT MAKE AMERICA STRONG

Plants at: PORT CHESTER, N. Y.; CORAOPOLIS, PA.; ROCK FALLS, ILL.; LOS ANGELES, CALIF. *Additional sales offices at:* ARDMORE (PHILA.), PA.; PITTSBURGH; DETROIT; CHICAGO; DALLAS, SAN FRANCISCO. *Sales agents at:* NEW ORLEANS, DENVER, SEATTLE. *Distributors from coast to coast.*

The Answer to Cost Problems

T AND W DEEP DRAWN STAMPINGS

Are you, too, facing constantly mounting material and labor costs? You may find substantial economies in production by redesigning to use light-weight, easy-to-assemble T & W Deep Drawn Stampings.

Transue & Williams

ALLIANCE, OHIO

Designers and Makers of Deep Drawn Stampings

Sales Offices: New York, Philadelphia, Chicago, Detroit, Indianapolis, Cleveland

ployment—one that the UAW will be able to point to as getting its foot in the door. Concessions and back-pedaling will be frequent, but there is no doubt but that the UAW is ready to strike to establish the principle.

As stated here previously, Ford appears to be the most logical point of attack. The UAW does not want to strike Chrysler, whose workers had a hard time in 1954. Furthermore, Chrysler sustained the last serious strike and its contract expires weeks later than Ford and GM. Actually, there is no reason to discount GM as the target, although Ford's "turn" seems to be coming up.

But assuming labor peace lingers on both world and labor fronts, what does 1955 hold out in new developments?

Most of the 1955 cars are already on the streets, by virtue of the industry's general trend toward advancing new models toward fall. Except for Packard, Hudson and Nash, most automotive developments will have to wait for the 1956.

Predicts 5.8 Million . . . Harlow H. Curtice, GM's president, has a reputation for being optimistic but correct in his predictions. He estimated that the upcoming year will see U. S. passenger car production of 5,800,000. This past year more than 5,500,000 cars were produced in the U. S.

If this 5,800,000 production is spread around a little more evenly, it could be prosperous year all around.

The past year might be called a reorganization and shakedown year. During its 12 months, the industry geared itself and set up the programs it believes necessary for a normal and peaceful economy. The process was costly and painful in some quarters and it will be reflected in red ink on more than one annual report.

But after taking its knocks in several directions, the industry appears to be entering 1955 in the best condition in many years. It is tooled and organized for just the conditions that appear to lie ahead. Confidence exudes from most segments of the industry.

Packard:

Has top power but sales will stress ride comfort.

AUTOMOTIVE NEWS

It appears proper that an annual review and forecast should tie in at least one new car announcement. And it is also fitting that Packard's new lines embrace all new styling, new V-8 engines, and an entirely new ride concept.

They could be considered typical of the efforts the industry is putting out to give the auto buying public something new and outstanding for the competitive period that 1955 will be.

While styling remained distinctively Packard, separation of Packard and Clipper lines is evident in 1955 lines. Both feature a sweep-around windshield, a forward thrust to the silhouette, and the lower, wider look characteristic of most 1955's.

Torsion Bar Suspension

Packard 400 and Patrician models are powered by a 352-cu-in. displacement V-8 engine generating 260 hp, tops in the field. Clipper Custom models have a 245-hp engine and the Super and Deluxe models have the third V-8 in the Packard stable generating 225 hp. A new Ultramatic transmission is also offered.

But probably Packard's biggest sales and engineering feature is the torsion bar suspension that puts ride qualities of several other luxury cars to shame. First in the U. S., it is standard on Packard and Clipper Custom models.

In simple terms, Packard torsion bar springing is a method of using a solid bar of spring steel to replace front coil and rear leaf springs of the conventional suspension.

Now Stress Comfort

Theorizing that horsepower has just about reached its peak as sales sex appeal, Packard will now concentrate on promoting comfort. It has the highest standard horsepower engine anyway. There is no doubt of the impact on the industry of 1955 Packard, the first entirely new car for S-P president James J. Nance since deserting the appliance field for the tough job of automaking.

THE BULL OF THE WOODS — **By J. R. Williams**

EASY, THERE, EASY! YOU'RE DENTIN' UP TH' GUY'S FANCY FINISH! HE'S HAVIN' A TEMPERMINT!
AFTER YOU'VE POLISHED AND SLAVED FOR SUPREME BEAUTY, AND EVEN PADDED FOR THE CHAINS, THESE UNARTISTIC LOUTS HAVE TO HANDLE IT!
HEROES ARE MADE-NOT BORN
J.R.WILLIAMS

BUILDS EXTRA SELLING POWER INTO YOUR PRODUCTS

1826
A forge was lighted
1955

The nation's newest cold rolled strip mill

At the press of a starter button, the nation's newest strip mill began rolling—and a master steelmaker continued a 129-year tradition of meeting industry's demand for precision quality steel.

For your products, select steel by a specialist . . . where custom-production and exact quality control are standard practice. A wholly integrated operation . . . undivided mine-to-mill-to-market responsibility . . . modern, up-to-date continuous mills and more than a century and a quarter of meeting the most rigid metallurgical demands—these are your assurances of the finest quality steel it is possible to produce.

IRON PRODUCTS
"Swede" *pig iron*
STEEL PRODUCTS
Plates (sheared)
Hot rolled sheets
Hot rolled strip
Cold rolled sheets
Cold rolled strip
ROLLED STEEL FLOOR PLATE
A.W. ALGRIP *abrasive*
A.W. SUPER-DIAMOND *pattern*
A.W. CUT NAILS
MINE PRODUCTS
COKE
COAL CHEMICALS

ALAN WOOD STEEL COMPANY

steelmasters for 129 years • CONSHOHOCKEN, PENNA.

DISTRICT OFFICES AND REPRESENTATIVES: Philadelphia • New York • Houston
Los Angeles • Atlanta • Boston • Buffalo • Cincinnati • Cleveland • Detroit • Pittsburgh
Richmond • St. Paul • San Francisco • Seattle • Montreal and Toronto—
A. C. Leslie & Co., Limited

SM-13

REVIEW FORECAST

THIS WEEK IN WASHINGTON

Expect More "Gentle Nudge" in 1955

Key decisions based on no war but strong defense . . . Administration's gentle nudge will make industry wheels go a little faster . . . Expect more cuts on tariffs, fewer tax changes—By G. H. Baker.

◆ WASHINGTON is going to arrive at its key decisions in 1955 on the basis of no war—but strong defenses. A steady beefing up of Army, Navy, and Air Force muscles may be expected.

This is the official philosophy that is guiding the top Eisenhower Administration planners in preparing the federal budget that will be sent to Congress later this month.

To defense contractors and subcontractors, it means that government procurement is headed for a limited, controlled spurt. Top military men in the Administration are now convinced that the nation's defense program must inevitably be stepped up, and with the least delay.

Mild Inflation . . . To wage-earners and consumers, this philosophy means that the wheels of the U. S. economy will spin a little faster in 1955. Wages and salaries will tend to edge up and prices of many manufactured goods will rise to a limited degree. A gentle but firm round of mild inflation will nudge up industrial prices as well as consumer prices.

This rise in government procurement activity will be a closely controlled, carefully calculated shot in the arm. Don't look for anything spectacular. There won't be anything resembling the frenzied contract-letting of the Second World War and of the Korean War.

The Federal Government today is in a position to arrive at its procurement decisions calmly and deliberately. It is beginning to feel more at ease, more mature, in its role as the nation's biggest single customer. Big-scale defense spending is here to stay.

Here's what to expect on major points of interest to business in 1955:

Construction Machinery Boom . . . Nearly obscured by the talk of a gigantic new program for highway modernization is the excellent outlook this year for road builders and suppliers of heavy engineering equipment. A reasonable estimate of the 1955 outlays for new highways is $4 billion, as contrasted with about $3.7 billion in 1954. Two important factors lead to this increase: (1) a 50 pct boost in the federal aid program, authorized by the 83rd Congress and becoming fully effective on July 1; (2) heavier activity in the toll road field. Aside from funds for new construction, about $3 billion will be spent for such additional work as maintenance and administration this year. In 1954, this figure was $2.7 billion.

"Stopped smoking."

Push Control Program . . . Unless the threat of a shooting war becomes more ominous, Ike won't insist upon standby production-price-wage-rent control authority. Two prominent congressmen—one Republican, one Democrat—predict the White House will limit its control request to a simple proposal that the Congress extend such portions of the Defense Production Act as provide power to allocate scarce materials. To halt inflation temporarily in the case of all-out fighting, the White House could use general war powers already available. However, no slow-up in control planning at the White House level is contemplated. Ike's advisers have prepared a complete set of regulations for all-out control of prices, profits, wages, salaries to go into effect at once—should Congress declare war or emergency.

No Taft-Hartley Change . . . The nation's labor law will remain virtually unchanged for at least another year. President Eisenhower will probably ask for about the same 14 amendments that stirred up such bitter—and fruitless—battles last year. The Democratic leadership, like the Republicans before them, will be unable to reconcile differences of opinion to the point where important amendments could get through. Two campaign pledges of the

FOR SIMPLIFIED TOOLING AND LESS SCRAP

Check into WATERBURY FARREL MULTIPLE STATION FORMING MACHINES

To minimize costs on your shallow or long forming operations, look into Waterbury Farrel Multiple Station equipment.

— It offers several advantages over the progressive die method.

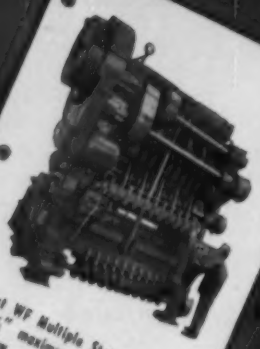
For example, these Waterbury Farrel machines can—

- CUT MATERIAL COSTS—By reducing scrap through more complete utilization of strip widths.
- REDUCE TOOL COSTS.
- PERMIT INDIVIDUAL ADJUSTMENTS FOR EACH TOOL.
- MAKE TOOL CHANGES QUICKER AND EASIER.

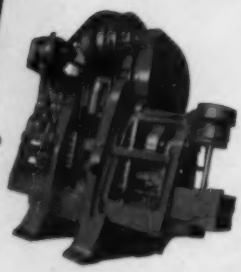
The machines shown here are just a few examples of Waterbury Farrel's line of multiple station forming equipment. All are ruggedly engineered for long-lived efficiency and low maintenance operation.

Write or phone for further information.

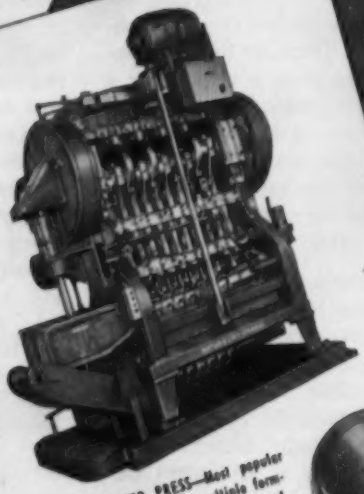
WF DOUBLE GATED PRESS—for two or three operations.



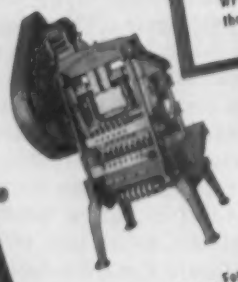
Largest WF Multiple Station Machine for 6½" maximum blank—3¼" deep draw.



WF ESCUTCHEON PLATE MACHINE — for heavy forming.



WF MULTIPLUNGER PRESS—Most popular machine for hardware and multiple forming work where medium swaging and drawing is required. Has new, electrically operated air clutch—individual plunger operation and adjustments — four motion transfer bars with safety fingers. At the delivery end, conveyor lifts finished work to barrel height.



WF TRANSFER PRESS — For shallow work and higher speed operation.

WF CRANK EYELET MACHINE — These machines are designed for lighter work than multiple plunger presses, but will handle heavier forming than WF's cam Eyelet Machines.

WATERBURY FARREL FOUNDRY & MACHINE CO. — WATERBURY, CONN.

WATERBURY FOUNDED 1851 FARREL

POWER PRESSES — Crank, Cam and Toggle; also Rack and Pinion Presses • Eyelet Machines • Multiple Plunger Presses • Horizontal and Hydraulic Presses, etc. **MILL MACHINERY** — Rolling Mills: Strip, Rod, Wire Flattening. (For Ferrous and Non Ferrous Metals) • Also Slitters • Straighteners • Cut-off Saws • Coilers • Winders, etc. **WIRE MILL EQUIPMENT** — Continuous Wire Drawing Machines (Upright Cone and Tandem) • Wire Flattening Mills • Chain Draw Benches • Pointers • Swagers • Bull Blocks • String-up Machines • Spoolers, etc. **COLD PROCESS BOLT & NUT MACHINERY** — Headers (all types) • Rivet Machinery • Trimmers • Thread Rolling Machines • Slotters • Nut Formers and Tappers, etc.

President to knock out the misnamed "union busting" provision and to require that employers sign anti-Communist affidavits, might win passage. But both industry and labor consider them technically unimportant, and of doubtful political value now.

Little More Spending . . . Level of government outlays in the fiscal year beginning next July 1 will serve to nudge the economy gently upward. President Eisenhower's budget will call for spending to run almost $64 billion, about the same as this year. A little more inflation is in prospect, as additional appropriations required to finance the program may run as much as $5 billion more than this year, and the deficit is expected to remain about the same, between $4 and $5 billion. Reduced appropriations for military aid and economic aid to Europe will largely be offset by a new Asian aid program, increased spending for public works such as highways, and pay raises for federal workers and service men.

$35 Billion Arms Outlay . . . Congress, after some brow-wrinkling over a Defense Dept. request for approximately $35 billion in new money for fiscal 1956, is going to give the military about what it asks. For the major services, the split will allow the Air Force some $15 billion, the Navy upwards of $10 billion, and the Army $9 billion. The Air Force anticipates a share exceeding that for fiscal 1955 by more than $3 billion. In procurement terms, this will mean more electronics gear, more missiles, plus plane deliveries at about the current rate.

Lower Tariffs . . . The new Democrat-controlled Congress will be inclined to go along with President Eisenhower's proposal that the Reciprocal Trade Act be extended for 3 years, with the White House granted power to cut selected tariffs as much as 5 pct a year for the 3 years. Democrats will take pains to push the program slowly to dramatize the GOP split on the question — a split which will be more pronounced this year as many Republican lawmakers who supported Ike last year break away to protect their own local interests. Some important tariff cuts may also be made even before the new trade law is passed. Thirty-three nations are now reviewing international trade contracts, and final agreements probably will include some cuts by the U. S. under the present trade law.

Expect Antitrust Changes . . . It's a good bet that Congress will amend the antitrust laws along the lines recommended by a 60-member study committee appointed by the Attorney General. Antitrust legislation has lots of popular appeal to politicians. Bitter fights will be stirred up by a tentative proposal that labor unions be made subject to the antimonopoly statutes — the Administration is split on the question. Chances are that unions will marshal enough strength to block this plan. In other antitrust areas, two laws designed to aid small business-fair trade and Robinson-Patman may be due for some basic rewriting.

Few Tax Changes . . . There's little possibility of major changes in the nation's tax laws during 1955. The Administration is now committed to blocking a scheduled drop in the corporation tax and certain excise tax rates. Democratic leaders may try to increase the corporation rate above the present 52 pct, but the move will stir up only hot air, not action. A Treasury Department proposal that a 5 pct manufacturers sales tax be imposed on all processed goods has a somewhat better chance of passage. It is backed by powerful industrial groups, but it is by no means a sure thing. Democratic tax writers will also make a stab at increasing personal income tax exemptions by $100 or $200, but budget-conscious Senate conservatives in both parties will block it (President Eisenhower would sign such a cut for political reasons if it should pass).

Stockpile Needs . . . Supplies of nickel, selenium, tantalum, and strategic mica remain far below the quantities required by the government to meet present strategic stockpile goals. These and 14 other items are designated as critical because goals for them are less than 50 pct filled. Still being bought as part of this program are another 19 materials, objectives for which are more than half completed, and a handful of additional, nearly-completed items. Heavier buying in many lines may be required if President Eisenhower puts his weight behind a recommendation by the Cabinet Committee on Mineral Policy that all stockpile goals be reviewed and new long-term objectives established.

Atom Report Coming . . . Within the next 60 days, the Atomic Energy Commission must present to Congress a report important to all businessmen interested in industrial uses of the atom. The agency must give details to the Joint Committee on Atomic Energy of its actions and proposed actions in carrying out the 1954 amendments to the Atomic Energy Act.

Regulations which AEC must issue in conformity with the amended act will have considerable bearing on the private utilization of nuclear energy. Certain to be reopened is the debate in Congress over the five-year compulsory licensing provision in the Act. Industry would like to see this stipulation dropped, but chances are slim while the Democrats are in the majority.

A AVAILABILITY
S SERVICE
Q QUALITY

you get all three with

B & W CARBON STEEL

SEAMLESS

MECHANICAL TUBING

A AVAILABILITY

Buying convenience through a single source of hot-finished and cold-finished carbon steel tubing, produced in a wide range of grades and sizes.

S SERVICE

You can save through the dependable assistance of B&W Regional Representatives and qualified distributors, trained to help solve fabrication problems and to assist in tube selection.

Q QUALITY

Mechanical properties, machinability, tolerances and surface finishes combined for ease of fabrication in your specific application.

remember A S Q *is meant for you.*

B&W SEAMLESS and WELDED TUBES

THE BABCOCK & WILCOX COMPANY
TUBULAR PRODUCTS DIVISION
Beaver Falls, Pa.—Seamless Tubing; Welded Stainless Steel Tubing
Alliance, Ohio—Welded Carbon Steel Tubing

TA-4048 (CSM)

REVIEW
FORECAST

Steel, Aluminum Will Boom in '55

Foresee peacetime record steel use in Far West for '55 . . . Northwest aluminum output to mount . . . Need firm power expansion plans . . . See growth for automotive parts suppliers—By R. R. Kay.

◆ RECORD-BREAKING industrial development on the West Coast takes on the appearance of normality because it's happening all the time.

Year after year production records fall in manufacturing, construction, and agriculture. This happy state of affairs gives no sign of letting up. (See THE IRON AGE, Nov. 25, 1954, "Salute to the West.")

Its been said, "Set the country on edge and everything loose will fall into the West." Population growth here will continue at a terrific pace if the population of the eastern centers holds out. By 1960, the 11 western states could have 28 million people, an increase of 7 million

This reporter has watched the industrial developments here for 18 years. Here's now it looks for 1955:

Steel . . . Far-western steel consumption could run well over 6 million tons for a new peacetime record. Consumption in 1954 was roughly 5.4 million tons. Since World War II $5 billion has gone into new manufacturing facilities. Last year, in California alone, $400 million was invested in 1140 new plants and expansions. Continued industrialization means more demand for steel made close to point of use.

Aluminum . . . Market is increasing in size and diversification. Pacific Northwest looks to boost its present 40 pct output of the nation's primary aluminum.

The area hasn't completely awakened to its opportunities in aluminum product manufacture. Its thousands of skilled aluminum workers are the nucleus of a fabricating industry that could be greatly expanded. One shortage clouds the horizon — absence of firm schedules for expansion of electric power capacity to meet expected loads after 1958. During the next 20 years $7 billion must be poured into Northwest power development. Right now there are applications on file with the Federal Power Commission for $2 billion in power development projects to generate 6 million kw.

Aircraft . . . Continues to be the West Coast's largest employer. This industry will continue strong through 1955-56. Orders totalling $6 billion are on the books. Number of planes produced will be lower, but employment will stay at 1954 levels—260,000, with a weekly payroll of $25 million. Growing weight and complexity of modern supersonic planes require more manhours per plane. Eight million design hours are needed for one modern bomber. Also, the industry is expanding its guided missile development and production.

"Play the ace."

Shipbuilding . . . West Coast shipyards can look for $65 million in ship construction—a fair share of the $400 million Congress appropriated for shipbuilding.

Auto Assembly . . . Automakers, concentrated in California, should hit well over 560,000 units assembled in 1955. Further growth of assembly plants will be geared to expansion of the market. The day of local stamping plants for major parts is not yet here; but one thing is certain—more and more parts and components will be made locally. Why? Automobile manufacturers recently reduced freight charges on West Coast deliveries, about $135 in the low-priced group. It's good business for them to have parts made as near as possible to their assembly plants, and save the freight on the long haul from Detroit.

Electronics . . . Volume may hit about $1 billion in 1955, an increase of roughly 20 pct over 1954. New plants are busting out all over. Several large national firms not now in the electronics field are eyeing and buying with diversification in mind. Buying medium-sized, established electronics organizations rather than setting up new companies is the trend.

Ordnance . . . Business is now at a $1-billion level, and will continue very strong through 1955. Guided missile research and production and armored vehicle manufacture will still be the mainstay. More ordnance business could come to the West if there were sizable ammunition-loading factories here.

obsolete machines are costing you plenty!

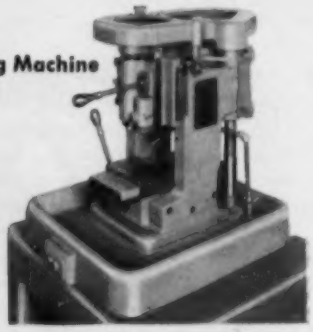
. . . you can make money with these 4 Wade precision machines

To keep pace with your competition, you need the latest, *most efficient* production machines you can buy. Here are four that are remarkably accurate — designed and built throughout for precision work to close tolerances. Some of the features on each machine are patented and exclusive. All machines are carefully described in Bulletins, available on request.

No. 8A Tool Maker's Precision Lathe

A variable speed feed for the feed rod is available as optional equipment. It provides an independent powered longitudinal or cross feed which permits the operator to change the rate of feed while the tool is under cut to secure the desired work finish during turning, facing or boring operations. The rate of feed for variable speed feed is controlled by a potentiometer.

Hand Profiling Machine



No. 73 Hand Screw Machine

No. 73 Standard Bench Lathe

Write to **60 RIVER STREET**

THE WADE TOOL CO.

WALTHAM 54, MASS., U. S. A.

MAKERS OF PRECISION TOOLS FOR AMERICAN INDUSTRY

REVIEW FORECAST

MACHINE TOOL HIGH SPOTS

Builders Have Triple Sales Hope

Industry hopefully predicts '55 will equal '54 . . . But trend will have to be reversed to do it . . . Hopes are pinned to heavier defense buying, more civilian sales, increased tool exports—By *E. J. Egan, Jr.*

◆ MACHINE TOOL industry officials hopefully predict 1955 shipments about equal to the 1954 total of approximately $885 million. Billings for the new year won't be up to the $1.2 billion level of 1952-53, but should be considerably better than the 1951 total of $620 million.

New orders will tell the story this year. For 1954 they totaled only about $540 million, running far behind shipments. They will have to reverse sharply to make 1955 predictions come true. Size of the sales job to be done is indicated by latest industry statistics from National Machine Tool Builders Assn. Cleveland headquarters. They show that the final 1954 quarter could be the worst the builders have had for several years.

November Dip . . . NMTBA's estimated new order index for November dropped again, touching 121.0 for the lowest monthly figure since May 1950. And the preliminary shipment index for November dipped to 181.0, lowest point this scale has shown since August 1951.

With industrial expansion tapering off, how do machine tool builders expect to ship almost $900 million in new equipment this year? Their optimism is based on (1) more defense orders from Washington, (2) positive results from next September's giant Machine Tool Show, (3) more export business.

At least $100 million in new business will come from the armed services in 1955 to get the long-delayed Vance Plan underway. And Defense Dept. officials will seek more money for "reserve tools and facilities" when they present 1955 budget requests to the new Congress. With good planning and some luck the military might get these additional Vance Plan funds. If so, it's conceivable that military orders could total considerably more than the original $100 million before calendar 1955 ends.

Hope for Elephants . . . Elephant tool builders are hoping for still another break from Washington this year. Industry and government officials are working hard to set up this phase of the ODM's industrial equipment reserve. Talk of $40 million's worth for a starter has been bandied around, perhaps somewhat prematurely.

Some elephant tool orders are certain to come eventually, but the actual spending could be considerably less, or more, than $40 million. A detailed study must first be made to match needs against tools known or suspected to be available.

"And the mating call is almost as thrilling as the sound of a newly designed machine in action."

Turbine, Gear Capacity . . . A third and still somewhat hazy Washington possibility for new machine tool business is buried in the files of ODM's Inter-Agency Component Committee. This group concerns itself with specialized mobilization planning, apart from the military or ODM elephant tool programs.

A turbine and gear study is already completed. It shows that a capacity deficiency exists in this area, about $65 million worth according to the committee's interim recommendation. If reviewing boards agree with this decision, money to start the turbine and gear buildup could be made available by Defense Production Act borrowing authority. This would undoubtedly mean some new machine tool business.

Push Show Sales . . . But builders won't spend all their time this year helping government officials make up their minds. Civilian customers and prospects will still get the lion's share of attention. And sales campaigns will reach a climax at the Machine Tool Show in Chicago this September. It will be the first industrywide show since 1947. Builders hope a display of 7 years of machine tool progress will convince metalworking management that obsolescence doesn't pay.

a CMP cost cutting report

ON INTRICATE PARTS

BEFORE

This manufacturer of intricate machine parts had numerous fabrication problems with standard specification cold rolled strip steel. First, the gauge tolerance variance presented difficulty when finished parts went to assembly where a close fit was required, causing many rejects. Production slow-downs were frequent and costly. Die life was shortened, too. Even though the parts are small and produced in great quantities where cost of steel per piece is insignificant, the resulting finished product cost was mounting because of the difficulties and added manual work.

AFTER

Presenting the CMP story of "specific specs" to the purchasing department of this manufacturer, a CMP representative was invited to meet with their production management. He suggested several different specifications for the various items they were producing and arrangements were made to test run the "specific spec" steel for their own check.

Improved results were immediate and final specifications for all items were established as best for each job. As was later related, the production chief said, "While our steel cost went up, we so completely beat our production and assembly problems that those savings dwarfed the steel cost." Perhaps there is an answer for your requirements, too, in CMP "specific specs" cold rolled strip steel -- we'll be glad to explore it with you.

CMP

COLD ROLLED STRIP STEEL

reduced manual and operation costs ...increased production

CMP . . .
WHERE YOU CAN GET SPECIFIC SPECS. FOR SPECIFIC JOBS

LOW CARBON
HIGH CARBON
Annealed or Tempered
STAINLESS
ALLOY
ELECTRO ZINC COATED

the Cold Metal Products co.

GENERAL OFFICES: YOUNGSTOWN 1, OHIO
PLANTS: YOUNGSTOWN, OHIO AND INDIANAPOLIS, INDIANA
SALES OFFICES: New York • Cleveland • Detroit • Indianapolis • Chicago • St. Louis • Los Angeles • San Francisco

LOW CARBON, HIGH CARBON (Annealed or Tempered), STAINLESS AND ALLOY GRADES, ELECTRO ZINC COATED ARE AVAILABLE FROM:

THE COLD METAL PRODUCTS CO. OF CALIFORNIA
2131 South Garfield Avenue, Los Angeles — Phone: RAymond 3-4581

THE KENILWORTH STEEL CO., 730 Boulevard, Kenilworth, New Jersey
Phones: N. Y., COrtlandt 7-2427; N. J., UNionville 2-6900

PRECISION STEEL WAREHOUSE, INC.
4425 W. Kinzie, Chicago — Phone: COlumbus 1-2700

HOW TO DO BUSINESS WITH THE GOVERNMENT

Fast amortization still available 226
How U. S. helps small business 227
Renegotiation—still a threat 228
How to go after a government loan 229
Stockpiles—U. S. must add to them 230
Where to seek a government contract 231
Who's who in government offices 232

Arms Spending To Rise in '55

◆ MILITARY purchasing in 1955 will be substantially higher than in 1954. The Eisenhower Administration's budget experts are now in complete—if somewhat reluctant—agreement that Defense Department buying of military hardware must now be stepped up to offset new threats of Communist aggression.

The Army, Navy, and Air Force combined have a total of about $35,500,000,000 at their disposal in this fiscal year. This includes $29,400,000,000 in new money. The balance is accounted for in funds carried over from previous fiscal years. The $35,500,000,000 figure is about $1 billion below what the military had requested of Congress.

While it is premature to forecast the size of the sum to be voted by the Congress this Spring for spending in the fiscal year starting July 1, it is reasonable to believe that total military spending will be closer to the $35 billion mark.

Prominent Democrats who will hold key positions of leadership in the Senate and the House hint strongly that they intend to vote bigger military appropriations for the principal and obvious reason of building strong national and international defenses, but also for the collateral effect that such spending will have in relieving unemployment and generally getting the wheels of the nation's economy to spin faster.

Machinery Sales to Rise

Uncle Sam, already the nation's biggest customer both in value and volume of goods and services is therefore to become an even bigger one this year.

A sizable slice of the military spending dollar will go to the machinery industry. Congress in 1954 voted an appropriation of $100 million to be spent exclusively on machine tools for military production. The Defense Department was slow to obligate the sum, but finally late in 1954 earmarked the biggest chuck of this fund for procurement of tools for Air Force contracts.

It is entirely possible that the Defense Department will ask Congress for a fresh appropriation (probably something less than $100 million) to continue the tool-buying program beyond June 30 into fiscal 1956.

HOW TO DO BUSINESS WITH THE GOVERNMENT

Fast Amortization: It's Still Available in Key Situations

◆ THE federal government's fast tax-amortization program is slowing down from the fast pitch it hit in 1952, but firms seeking to establish new plants or expand existing facilities with tax aid in 1955 will find their opportunities at least as good as in 1954.

Slowdown is caused by fulfillment of goals which are removed from the list and not replaced by others. Of some 230 expansion goals set by the Office of Defense Mobilization since the program started, only 84 are still open.

Many of the open goals, however, are in the metalworking fields. High on the list of lagging goals are facilities for producing iron castings, freight cars, diesel locomotives, oceangoing tankers and inland waterway vessels.

The expansion program was initiated to promote construction of facilities to produce the volume of goods which this country would need in event of a shooting war. The original legislation stipulated that small business must get a fair opportunity to participate in the program, and that dispersal requirements would be considered. Later action authorized a 5 pct premium amortization be granted for small business and that dispersion factors be applied to all applications over $1 million, with facilities in congested urban areas ineligible for certificates unless a dispersed site was proved economically unfeasible.

In the most recent changes in the program, ODM provided for premium percentages for plants located in labor surplus areas, and upped the percentage for freight car facilities from 75 to 80 pct.

By November, ODM had issued certificates for construction with a value of $30 billion, of which an average of 60 pct had been granted fast tax write-off benefits, permitting the facilities to be amortized for tax purposes in 5 years. Late this fall, some 350 applications were pending.

Average time lag between filing an application and final action by ODM is 6 weeks.

The tax amortization program, as a means of spurring construction of necessary mobilization production facilities is considered very good by government officials.

METALWORKING EXPANSION GOALS STILL OPEN

Facilities to produce—steel castings over 2000 lb, sheets, structural shapes; tin plate; alumina, aluminum forgings, sheet and tube; steam boilers; coke and by-products; compressed gas cylinders; gray iron castings over 3000 lb; horizontal wire braided hose; inland waterway terminal facilities; oil storage facilities; oil and gas pipe lines; port facilities; production facilities for military and atomic energy procurement including aircraft, electronic products, military photographic equipment, ordnance, vehicles and engines; railroad terminal and road facilities.

Products—Commercial aircraft; inland waterway vessels; locomotives of all types; inland and ocean-going ore carriers; railroad cars; tankers.

Mining, refining and extraction facilities—Bauxite, chemical and metallurgical grade chromite, coking coal, cobalt, columbite and tantalite ore, copper, iron ore and taconite, lead, fluorspar, manganese, mercury, molybdenum, nickel, zinc, selenium.

AN EXACTING CUSTOMER

◆ Doing business with the government is a complex and slow-moving operation. It is nearly always exasperating, and sometimes is costly—to the grief of the contractor. Government is an exacting and demanding customer, and may take its time in paying its bills. A federal contract is no bonanza. On the contrary, it could turn out to be costly for your firm unless you know exactly what your costs are and have figured your proposed contract in precise detail.

Many a smaller firm is far better off as a subcontractor than as a prime contractor. The government is a finicky customer to deal with. Unless your firm maintains a sizeable sales force (or maintains officials assigned to finding new business), you might well contact some of the larger firms and find out if they are not willing to farm out part of their government contracts. (Check the larger manufacturers of aircraft, aircraft parts, and automotive parts, for example.)

Uncle Sam is an exacting customer

HOW TO DO BUSINESS

WITH THE GOVERNMENT

Small Business: How The Government Helps

BY ARTHUR HACHTEN, Small Business Administration

◆ THE many problems faced by proprietors of small firms are receiving greater attention in Washington, largely through the efforts of a small but dynamic new agency, the Small Business Administration.

This agency has, under the direction of Wendell B. Barnes, developed a three-fold program of assistance to the nation's small firms, which number more than 4,000,000 individual enterprises.

The agency's three programs are: (1) Assistance to small firms in getting government contracts and subcontracts; (2) production and management assistance; and (3) financial assistance.

All of the agency's services are available in the field, through its 14 regional and 26 branch offices. The proprietor of a small firm who needs help does not have to go to Washington. He can obtain the full services of the Small Business Administration virtually at his own front door.

TO SMALL FIRMS: $300 MILLION

◆ Reviewing the first 14 months of SBA operation, Administrator Wendell B. Barnes notes that more than $300 million worth of military orders were booked for exclusive award to small firms during that period. These were set aside under the joint determination program conducted by SBA and the Defense Dept.

The SBA chief also lists these accomplishments of the agency: (1) Notification to small concerns of 136,000 prime contract opportunities; (2) an average of more than 1,000 referrals per month of subcontracting opportunities; (3) issuance of certificates of competency resulting in prime contract awards totaling nealy $5.5 million to 37 firms; and (4) publication of a "U. S. Government Purchasing Directory" and a "U. S. Government Specifications Directory" to give the facts of procurement to more small firms.

In volume and in intensity of demand, the major call upon the time and resources of the SBA has been in the financial area.

In developing the financial assistance program, SBA has worked closely with the private banks. The program is designed to supplement the lending facilities of private lending sources, and not compete with them.

Mr. Barnes has made it clear that the best service the SBA can render to small firms, is to help them develop a line of private credit in their home towns.

Private credit is first

To achieve this aim, the SBA has these firmly-established rules: When a proprietor of a small firm calls upon the agency for financial assistance, the first efforts are directed toward helping him organize his affairs so he can carry on without a loan. Next, an effort is made to help him obtain private credit.

It is only after there is a clear showing that private credit is not available that SBA will consider a loan, and even then it seeks to obtain participation in the loan by private banks.

How well this program of financial assistance has worked out is shown by these figures: As of Nov. 1, SBA had approved 953 loans totaling $51,908,554 to assist small firms.

The significant point is that nearly 70 pct of these loans—652 of them totaling $37,196,291—are bank-participation loans. In each of these cases, SBA is helping the firm to develop a line of local credit in its own community. Most of the loans approved by the agency are made to help a small firm expand, or to modernize so it can operate more efficiently and provide more jobs.

In many cases SBA is able to give effective help by assisting the small firm in obtaining a loan from private sources.

HOW TO DO BUSINESS WITH THE GOVERNMENT

Renegotiation: Dead, But It Won't Lie Down

◆ The Renegotiation Act, under which government prevents producers from making "excessive profits" on defense contracts, technically expired Dec. 31, but is not yet dead. Strong moves are building up to extend the Act, retroactively, for another year.

Under the Act, passed in 1951, and renewed in 1954, the Renegotiation Board receives annual reports from contractors as to profits, investment and other financial data. If there is an indication that a producer has made what is considered an "excessive" profit from government work, he may be made to repay part of it. But the Board makes it clear that it has no formula for determining how much profit a company may make.

Renegotiation is conducted on the basis of total profits for all government contracts held by a firm, and not by individual contracts, so that a firm may lose money on some, but make large profits on others and still be permitted to retain the profits.

There is no set profit, or limit, which guides the Board. Six factors are considered when renegotiating a contract:

1. Efficiency of the contractor in use of materials and labor and his efforts to economize. A sloppy contractor therefore might not be permitted as large a profit as an economical one.

2. Reasonableness of costs and profits in relation to his volume and normal earnings in war and peace time years compared with earnings under the government contracts.

3. Extent of risk the producers assumes under the government contract—a producer who subcontracts work instead of investing his own capital is not assuming as much risk as one who does invest in equipment to handle the contract.

4. Nature and extent of producer's contribution to the total defense effort. A producer who freely shares his research and development knowledge with other firms would be permitted a better profit than one who does not.

5. Character of the business—whether it requires precision skills and engineering or is a relatively simple production task.

6. Any other factor which might enter in (a catch-all). Firms who have not received word that their 1953 or 1954 contracts were before the Board are not yet safe. The agency is from 18 months to two years behind, but will continue to function until all those contracts are scanned if a law permitting them to review 1955 contracts is not passed.

Because of the lag, however, firms which may have good profits from government contracts in one of the last two years, but which lost money in the other will have a chance of balancing one year against the other under the "risk" provision of the renegotiation profits criteria (Number 3).

The Renegotiation Act may be extended.

WHO'S WHO AT GSA

◆ Purchasing activities of the General Services Administration—which spends $1 billion a year buying by sealed bid 40,000 types of products for the civilian agencies of government—are centered in two divisions. Firms seeking information on how to sell to GSA should contact:

For unfinished metals and minerals—A. J. Walsh, Commissioner of Emergency Procurement Service, Seventh and D Sts., S.W., Washington 25, D. C., REpublic 7-7500, ext. 2243.

For all fabricated items—Clifton E. Mack, Commissioner of Federal Supply Service, 18th and F Sts., N.W., Washington 25, D. C., EXecutive 3-4900, ext. 5264.

Information on what the government is buying may also be obtained from the "Daily Synopsis of Procurement," available at $7 a year, or from any of the Commerce Department's field offices. Purchasing centers of GSA are scattered throughout the country, usually near major supply sources.

HOW TO DO BUSINESS WITH THE GOVERNMENT

Gov't Loans: How To Get One

◆ SEVERAL methods have been set up by Washington to help qualified companies—large and small—get working capital needed in handling a government order. The only program specifically restricted to firms with less than 500 employees in their main and branch operations is the Small Business Administration plan, but small firms can also get in on the V-Loans, loans authorized by the Treasury Dept. under provisions of Sec. 302 of the Defense Production Act, and loans made under Section 13 (b) of the Federal Reserve Act.

SBA—This agency makes business loans to help small concerns build, convert, or expand facilities, or obtain working capital needed for performance of a federal contract. Maximum amount of SBA money to be used in a single loan is $150,000 and maximum maturity is 10 years. Applicant for one of these loans must have good character, show that he knows how to manage his business, have enough of an investment in the business so that with an SBA loan he can operate soundly, and have a probable future income to give "reasonable assurance" of repayment. SBA offers direct loans at 6 pct interest up to the maximum allowable figure, but Wendell Barnes, SBA administrator, likes to point out that some 70 pct of loans made are of the bank-participation type. SBA is allowed to participate in these loans up to 90 pct of the total, with a private lending agency handling the rest. In this way, less federal money is involved, and small firms improve their credit rating with private lenders. Through Oct. 15, SBA had made 611 participation loans amounting to $34.6 million, and 281 direct loans at $14.1 million.

You need not rush to Washington.

V-Loans—These are handled under the Federal Reserve System, with the businessman making application to his own bank, which applies to one of the Federal Reserve or member banks. The military, Atomic Energy Commission, General Services Administration, Interior, and Agriculture are the guaranteeing agencies. Federal Reserve banks act for these agencies. This type of loan is less in demand than it was a few years ago, but in the four years ended Sept. 30 there were 1355 loans amounting to more than $2.4 billion. Of these, 76 pct of the full number and 24 pct of the amount went to small firms.

ODM must okay certificate

Sec. 302 Loans—These are primarily for the convenience of a federal agency that needs a certain item or items for defense purposes. Value of the loan to the recipient firm is of secondary importance. The Treasury is the responsible authority, but Office of Defense Mobilization must okay a certificate of essentiality before any money changes hands. In approving the certificate, ODM authorizes the use of its borrowing authority in making the loan. There hasn't been a Sec. 302 loan since about March, 1953.

Sec. 13 (b) Loans—This plan, little used, provides that Federal Reserve System may lend working capital to a company that is unable to get financial aid through normal channels. Implication is that the risk may be higher than banks wish to take. No loan may be made to allow paying off of debts. Very few of these loans have been direct, most of them having been made through banks, trust companies, and financial houses.

HOW TO DO BUSINESS

WITH THE GOVERNMENT

Stockpiles: Gov't Ready to Add to Its Hoards

◆ The government will be a ready and eager buyer of scarce and strategic raw materials in 1955. Although about three-quarters of its purchase goals have now been met, this fraction represents the relatively "easy" portion of the government's multi-million acquisition program. The remaining one-fourth of the goal represents a shopping list that is tough—and expensive—to fill.

The estimated total value of stockpile objectives is around $7 billion. The actual inventory of products and commodities is now valued at around $4.5 billion.

Government buyers are faced with some important engineering questions in trying to fill their needs. For example: What's an adequate substitute for selenium? (This scarce material was placed on the government's shopping list in 1953, but so far no deliveries to stockpiles have been made.)

All the available supply of selenium is spoken for, and there is no known commercial method of materially increasing the supply, says the Office of Defense Mobilization, the federal agency responsible for buying and maintaining the government hoards of strategic goods.

The government is a realistic buyer. It does not "pull its rank" to corner all available supplies of any given commodity in periods of shortage. It tries to be fair with commercial buyers. It buys sparingly in periods of scarcity in order to keep available supplies flowing to industrial consumers. As shortages ease, it steps up its buying. It rotates its physical stocks of such commodities as rubber in order to prevent loss due to deterioration.

U. S. IS BUYING THESE FOR STOCKPILE

Abrasives, crude aluminum oxide
Aluminum
Antimony
Asbestos, amosite
Asbestos, chrysotile
Asbestos, crocidolite
Bauxite, metal grade
Bauxite, refractory grade
Beryl
Bismuth
Bristles, hog
Cadmium
Castor Oil
Celestite
Chromite, chemical grade
Chromite, metallurgical grade
Chromite, refractory grade
Cobalt
Coconut Oil
Columbite
Copper
Cordage fibers, abaca
Cordage, fibers, sisal
Corundum
Cotton, extra long staple
Diamonds, Industrial[1]
Feathers & down, waterfowl
Fluorspar, acid grade
Fluorspar, metallurgical grade
Graphite, amorphous grade
Graphite, crucible grade
Graphite, lubricant and packing grade
Hyoscine
Iodine
Jewel bearings, instrument jewel except vee jewels
Jewel bearings, sapphire and ruby vee jewels
Jewel bearings, watch and time-keeping device jewels
Kyanite
Lead
Magnesium
Manganese ore, Battery grade
Manganese ore, Chemical grade
Manganese ore, metallurgical grade
Mercury
Mica, muscovite block, good stained and better
Mica, muscovite block, stained (radio tube quality)
Mica, muscovite film
Mica, muscovite splittings
Mica, phlogopite splittings
Molybdenum
Nickel
Opium
Palm Oil
Platinum group metals, iridium
Platinum group metals, platinum
Pyrethrum
Quartz crystals
Quinidine
Quinine
Rare earths
Rubber, crude natural
Sapphire and ruby
Selenium
Shellac
Silk
Sperm oil
Talc, steatite, block
Tantalite
Tin
Tungsten
Vanadium
Vegetable tannin extract, chestnut
Vegetable tannin extract, quebracho
Vegetable tannin extract, wattle
Zinc

[1] Two stockpile objectives have been set for diamonds, industrial—one for stones and one for crushing bort.

Where to Seek a Government Contract

◆ The United States Government is the world's largest single buyer of machinery, equipment, supplies and services, with some 5 million different items in its buying list.

Selling to the government is not easy; competition is stiff. A manufacturer must stress quality, price and availability as much as when he sells in an open market. In addition, he must follow procedures required by government purchasing offices.

Government procurement offices, military and civilian, use two methods of buying—advertising for competitive bids and negotiating for what is needed. Negotiated purchases are limited by law to carefully defined conditions, such as those amounting to less than $1,000 or purchasing perishable goods.

First step in selling to the government should be to locate all agencies purchasing the goods which a firm markets, and getting on their bid lists. Second, a manufacturer should subscribe to the U. S. Commerce Department's daily "Synopsis of Procurement" which lists goods being purchased. Subscription is $7 a year from the Superintendent of Documents, Washington 25, D. C.

Small Business Administration lists in its "U. S. Government Purchasing Directory," also available from the Superintendent of Documents for 50¢, all classes of items purchased and the purchasing centers.

In writing to get on bidding lists, be specific about the items to be sold and include a full history of the plant and its capacities. If there is doubt as to whether contract specifications can be met, the purchasing agency should be asked for details.

In addition to getting on bidding lists and keeping close watch on the daily Synopsis of Procurement, an alert manufacturer should contact all government agencies in his areas to see what products they are buying in small quantities from time to time, and might look to the larger manufacturers for subcontract work.

Another aid to getting government contract work comes from the Small Business Administration. SBA will help bring plant facilities to the attention of Government purchasing officers; help secure financing either through a bank or by a direct government loan; will certify a plant as financially and technically able to fulfill a contract if there is doubt by the purchasing agent, and make available other reference sets on packaging and packing to meet military standards.

Plant officials are advised not to make a trip to Washington to find out about government contract opportunities. Most government purchases are made from other cities, and all information available in Washington is available at regional offices of the SBA, or can be obtained through a field office.

WHO'S WHO AT THE OFFICE OF DEFENSE MOBILIZATION

Executive Office Bldg., 17th St. & Pennsylvania Ave., N.W. Telephone: EXecutive 3-3300

	EXT.	ROOM
Arthur S. Flemming, Director	2102	102
Victor E. Cooley, Deputy Director	3461	188
James F. Brownlee, Special Consultant to the Director	2036	184
Harold S. Vance, Special Consultant to the Director	2116	105
Charles E. Kendall, General Counsel	2123	178
James H. Taylor, Assistant Director for Manpower	3866	200
*William S. Floyd, Assistant Director for Materials	3313	4743
Lt. Gen. W. S. Paul (Ret.), Assistant to the Director for Plans and Readiness	3235	216
*George A. Landry, Assistant Director for Production	3355	4921
Nelson Eddy (Acting), Assistant Director for Stabilization	2182	174½
Harold M. Botkin, Assistant Director for Telecommunications	2280	6
William Y. Elliott, National Security Council Staff	3427	18
Lee A. DuBridge, Chairman, Science Advisory Committee	3563	160
Howard A. Rusk, M. D., Chairman, Health Resources Advisory Committee	2233	112
David Z. Beckler, Special Assistant for Scientific Liaison	3563	160
Joseph D. Keenan, Special Assistant to the Director	3625	181
Lee W. Schooler, Information Officer	2201	107
Vincent A. Rock, Special Assistant to the Director	2482	188
*John P. Dennis, Defense Transportation Coordinator	3522	4921
* New GAO Building	Sterling 3-5200	

HOW TO DO BUSINESS WITH THE GOVERNMENT

COMMERCE DEPT. FIELD OFFICES

INFORMATION ABOUT GOVERNMENT CONTRACTS MAY BE OBTAINED FROM YOUR NEAREST U. S. DEPARTMENT OF COMMERCE OFFICE

Albuquerque, N. Mex.
206 U. S. Courthouse

Atlanta 5, Ga.
Room 336
Peachtree and 7th St. Bldg.

Boston 9, Mass.
Rm. 1414
U. S. Post Office & Courthouse

Buffalo 3, N. Y.
504 Federal Bldg.
117 Ellicott St.

Charleston 4, S. C.
Area 2 Sergeant Jasper Bldg.
West End Broad St.

Cheyenne, Wyo.
307 Federal Office Bldg.

Chicago 6, Ill.
226 West Jackson Blvd.

Cincinnati 2, Ohio
442 U. S. Post Office & Courthouse

Cleveland 14, Ohio
1100 Chester Ave.

Dallas 2, Tex.
1114 Commerce St.

Denver 2, Colo.
142 New Custom House

Detroit 26, Mich.
438 Federal Bldg.

El Paso, Tex.
Chamber of Commerce Bldg.

Houston 2, Tex.
430 Lamar Ave.

Jacksonville 1, Fla.
425 Federal Bldg.

Kansas City 6, Mo.
2001 Federal Office Bldg.

Los Angeles 15, Calif.
Rm. 450, Western Pacific Bldg.
1031 South Broadway

Memphis 3, Tenn.
229 Federal Bldg.

Miami 32, Fla.
947 Seybold Bldg.
36 NE. First St.

Minneapolis 2, Minn.
607 Marquette Ave.

New Orleans 12, La.
333 St. Charles Ave.

New York 17, N. Y.
Grant Central Annex
U. S. Post Office
110 E. 45th St.

Philadelphia 7, Pa.
Jefferson Bldg.
1015 Chestnut St.

Phoenix, Ariz.
137 North Second Ave.

Pittsburgh 22, Pa.
617 Fulton Bldg.
107 Sixth St.

Portland 4, Oreg.
217 Old U. S. Courthouse

Reno, Nev.
1479 Wells Ave.

Richmond 20, Va.
900 North Lombardy St.
The Annex, Rm. 264

St. Louis 1, Mo.
910 New Federal Bldg.

Salt Lake City 1, Utah
222 S. W. Temple St. (R-105)

San Francisco 11, Calif.
419 Customhouse
555 Battery St.

Savannah, Ga.
235 U. S. Courthouse &
Post Office Bldg.

Seattle 4, Wash.
805 Federal Office Bldg.
909 First Ave.

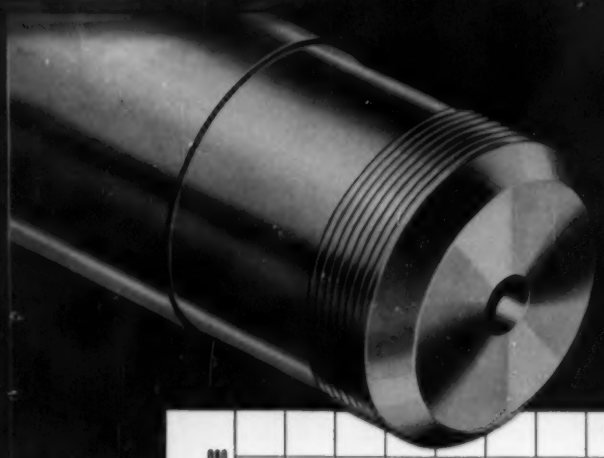
BUSINESS AND DEFENSE SERVICES ADMINISTRATION (U. S. Department of Commerce)

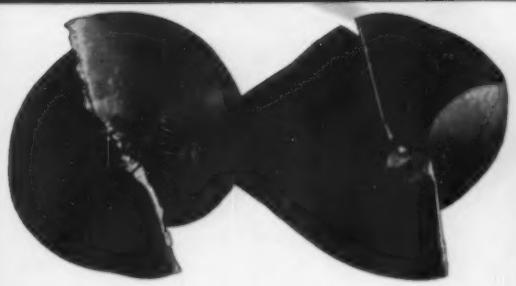
14TH ST. & CONSTITUTION AVE., N. W., WASHINGTON, D. C.
TELEPHONE: STerling 3-9200

OFFICE OF THE ADMINISTRATOR	EXT.	ROOM
Charles F. Honeywell, Administrator	4913	4848
Todd Wright, Special Assistant to the Administrator	4805	4833
H. B. McCoy, Deputy Administrator	5112	4838
William E. Haines, Assistant Deputy Administrator	4604	4834
Wm. A. White, Sr., Assistant Administrator	5025	4858
Ralph E. Cross, Assistant Administrator	4901	4852
John A. Field, Assistant Administrator	4901	4852
George E. Lawrence, Deputy Assistant Administrator	3342	4837
SPECIAL STAFF SERVICES		
P. G. Asher, Director of Administration	4106	4861
George W. Auxier, Executive Secretary	4829	4545
Wayne Chambers, Administrative Officer	4788	4857
Richard S. Blaisdell, Public Information Officer	4805	4833
Herman Director, Advisor for Stockpiling	656	4818
George T. Elliman, Advisor on Foreign Activities	3048	4845
Howard R. Gaetz, Advisor on Government Competition	2773	4329
Dudley A. Hendrick, Advisor on Industrial Defense	4865	4830-A
Charles R. Horsum, Acting Director, Industry Advisory Committees Staff	3717	4814-B
William M. Martin, Advisor on Secondary Materials	3717	4814-B
E. Frederic Morrow, Advisor on Business Affairs	4723	4856
Burt W. Roper, Counsel for BDSA	2695	4824
William C. Truppner, Advisor on Industrial Mobilization Controls	4866	4830-A
William J. Zapp, Advisor on Priorities and Directives	3634	4818
John C. Green, Acting Dir., Office of Technical Services	2143	4878
Edwin W. Ely, Chief, Commodity Standards Division	3225	4527
Calvert J. Judkins, Chief, Trade Associations Division	3818	4516
Victor Roterus, Chief, Area Development Division	3636	7857
James L. Kelly, Director, Office of Small Business	4731	4864
Harry W. Ketchum, Acting Director, Off. of Distribution	4461	4886-B
Guy E. Wyatt, Director, Office of Field Services	3041	4870
Joseph A. Mack, Deputy Director, Off. of Field Services	2405	4870
Dr. Kurt E. Rosinger, Chairman, Industry Evaluation Board	4761	4314
AGRICULTURAL, CONSTRUCTION AND MINING EQUIPMENT DIVISION		
Deputy Director: John F. Skillman	4317	4111
ALUMINUM-MAGNESIUM DIVISION		
Director: George Perkins	4437	4807
Deputy Director: W. E. Dunlap		
AUTOMOTIVE DIVISION		
Director: George R. Davis	3294	4100
Deputy Director: George R. Curtis	3294	4100
BUILDING MATERIALS AND CONSTRUCTION DIVISION		
Deputy Director: Charles P. Redick	5227	4839

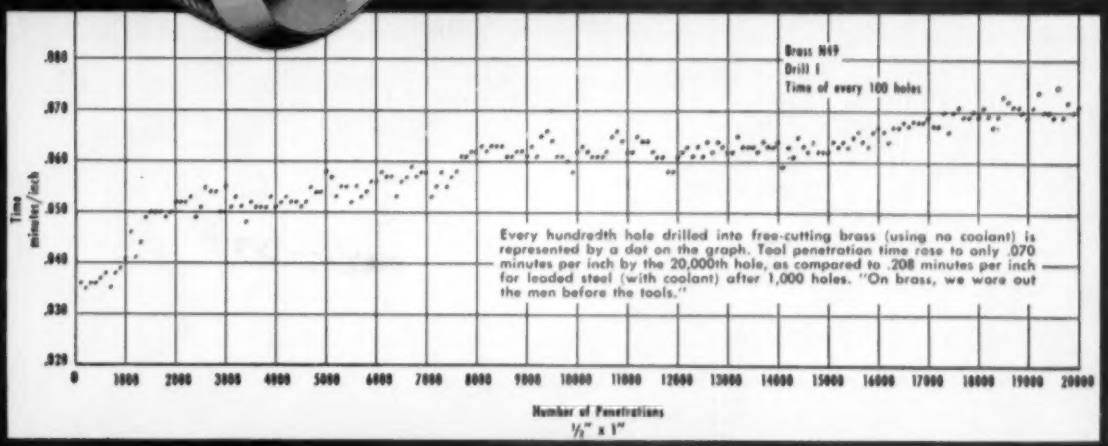
BUSINESS MACHINES AND OFFICE EQUIPMENT DIVISION	EXT.	ROOM
Deputy Director: James L. Oliver	3518	4001-A
CONSUMER DURABLE GOODS DIVISION		
Deputy Director: Charles F. Hughitt	3051	4325
CONTAINERS AND PACKAGING DIVISION		
Director: Charles A. Lewis	3961	4045
Deputy Director: Willis L. Rowlands	3961	4045
COPPER DIVISION		
Director: Ethan M. Pendleton	4074	4806
Deputy Director: William Meissner, Jr.	4117	4806
ELECTRICAL EQUIPMENT DIVISION		
Director: Clark M. Wright	2175	4114
Deputy Director: Carney G. Leslie, Jr.	2175	4114
ELECTRONICS DIVISION		
Deputy Director: Donald S. Parris	4036	4117
GENERAL COMPONENTS DIVISION		
Director: Clarence R. Burrell	3155	4126
Deputy Director: Harry S. Mills	3155	4126
GENERAL INDUSTRIAL EQUIPMENT DIVISION		
Deputy Director: Harry S. Mills	4327	4005
IRON AND STEEL DIVISION		
Director: Howard Mullin	4412	4812
Deputy Director: Charles Halcomb	2132	4814-A
METALWORKING EQUIPMENT DIVISION		
Director: Graham E. Marx	3525	4915
Deputy Director: Niels A. Olsen	3526	4915
MISCELLANEOUS METALS AND MINERALS DIVISION		
Deputy Director: Harry B. Sharpe	4551	4827
POWER EQUIPMENT DIVISION		
Director: John H. Sprague	4241	4120
Deputy Director: Ellsworth J. Hand	4241	4120
SCIENTIFIC, MOTION PICTURE AND PHOTOGRAPHIC PRODUCTS DIVISION		
Director: Nathan D. Golden	3102	4317
Deputy Director: Richard G. Woodbury	2911	4317
SHIPBUILDING, RAILROAD, ORDNANCE AND AIRCRAFT DIVISION		
Deputy Director: Francis H. Winget	4816	4827

WANT EXTRA COPIES? A limited number of copies of this special section will be available upon request to Readers' Service Dept., The Iron Age, 100 E. 42nd St., New York 17, N. Y.





Left—condition of drill after 1,000 holes in leaded steel (with coolant); right—condition of drill after 20,000 holes in free-cutting brass (no coolant).



exhaustive 20,000-hole drill test proves superior machinability of brass rod...

Titan

METAL MANUFACTURING COMPANY

Bellefonte, Pa. Offices and Agencies in Principal Cities

Is leaded steel as machinable as brass?

Lack of scientific machining data comparing these two metals prompted Titan to launch extensive research—not only in the laboratory but on the production line.

In a closely-controlled Constant Pressure Drilling Test using no coolant, the time to drill a ½"-diameter, 1"-deep hole in leaded steel increased 93.5% by the 200th hole. Penetration time for brass had increased only 6.45%. On this basis, brass was 14 times more machinable.

But Titan metallurgists went further. In an exhaustive effort to wear the drilling tool on brass to the same extent that 1,000 holes in leaded steel (with coolant) had worn it, a total of 20,000 holes were drilled in brass (using no coolant). Penetration time was only .070 minutes per inch for brass *after 20,000* holes as compared to .208 minutes per inch for leaded steel *after 1,000 holes.*

It was impossible to wear out the tool drilling 20,000 holes in brass. The test was stopped. "We wore out the men instead."

Read about Titan automatic screw machine production results comparing brass and leaded steel booster bodies. Send for free 48-page booklet titled "First Report." Use coupon below:

Dept. B

Titan Metal Mfg. Co., Bellefonte, Pa.

Gentlemen: Please send free booklet titled "First Report" about brass machinability.

Name_____

Title_____

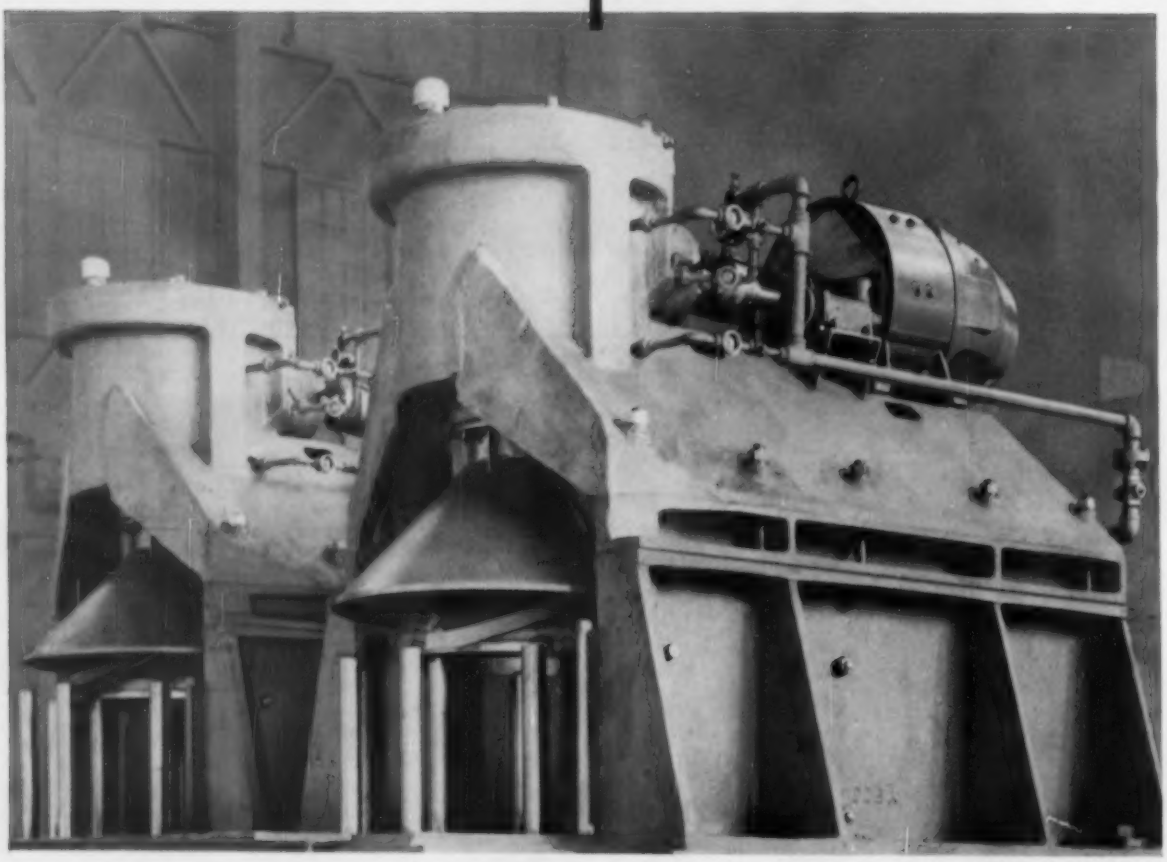
Company_____

Street_____

City & State_____

upon request to Readers' Service Dept., The Iron Age, 100 E. 42nd St., New York 17, N. Y.

BIRDSBORO | ONE source for all...



Rod Mill Laying Reels

ROD MILL EQUIPMENT

Designers and Builders of:

STEEL MILL MACHINERY
HYDRAULIC PRESSES
CRUSHING MACHINERY
SPECIAL MACHINERY
STEEL CASTINGS
Weldments "CAST-WELD" Design
ROLLS: Steel, Alloy Iron, Alloy Steel

High tonnage and low labor cost are more easily obtained when you look to BIRDSBORO for complete rod mill equipment. BIRDSBORO can supply all equipment for single-purpose rod mills for producing carbon, stainless and alloy steel rods. Likewise, you can turn to Birdsboro for combination mills producing rods, bars, flats and small structural shapes. For equipment custom-built to your requirements . . . see BIRDSBORO first.

BIRDSBORO

BIRDSBORO STEEL FOUNDRY & MACHINE CO., BIRDSBORO, PENNA. Offices in Birdsboro, Pa. and Pittsburgh, Pa.

time studies prove it!

15 man-hours saved for every 400 lbs. of lubricant you use!

Alemite cuts costs!

all the way from barrel to bearing ...in maintenance...repairs... down-time...

YOU SAVE...STEP BY STEP!

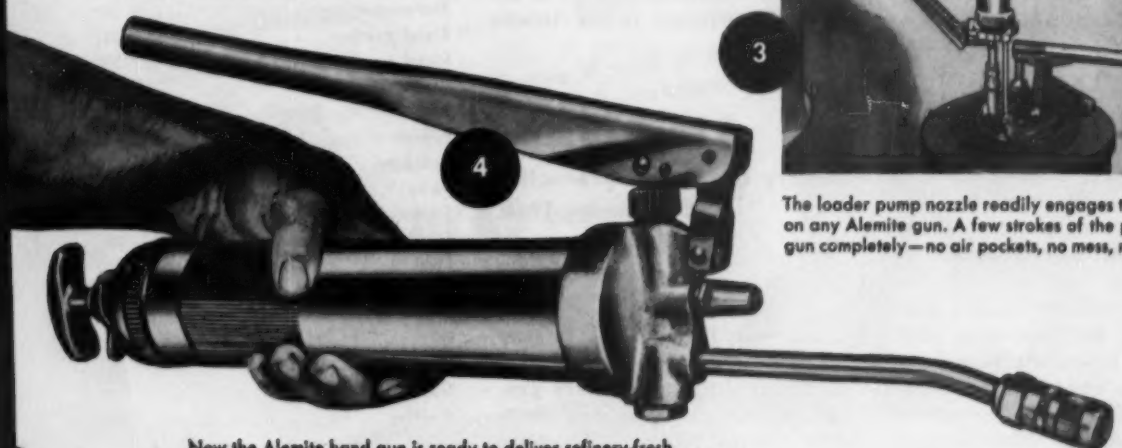
You start with a saving of 15 hours for every 400 pound drum of lubricant used. But that is only the beginning. Far more important is the saving in machine down-time, lubricant and costly bearing replacement. Because this combination of plant proved Alemite equipment insures better lubricated bearings—bearings lubricated only with "refinery fresh," protected lubricant!

There is an Alemite Hand Gun with the capacity you need—from 8 ounces to 2 pounds. With the pressure you need—up to 15,000 pounds! And there is an Alemite Loader Pump designed to fit any standard size container that you normally use. Stationary models for 100 and 400 pound drums. Portable models for 25 and 35 lb. pails.

A drum of general-purpose lubricant arrives in the oil room. Clean, sealed, fresh from the refinery.

As soon as the drum is opened, an Alemite Loader Pump for hand guns is inserted, completely reseals the drum, protects against contamination.

The loader pump nozzle readily engages the loader fitting on any Alemite gun. A few strokes of the pump fills the gun completely—no air pockets, no mess, no waste!



Now the Alemite hand gun is ready to deliver refinery-fresh lubricant to any machine—lubricant completely free of dirt, grit, or abrasives—protected from barrel to bearing!

With Alemite Plan "A"
Only Refinery Clean Lubricant Reaches Machines

This combination of Loader Pumps and Alemite Hand Guns is known as Alemite Plan "A." It is one of five Alemite plans that your nearest Alemite supplier can show you. Ask him for your copy of the new Alemite booklet, "5 Plans for Better Lubrication." It will help you make lubrication plans that save money in your plant!

FREE! **New Booklet: "5 Plans for Better Lubrication"**

ALEMITE, Dept. N-15, 1850 Diversey Parkway, Chicago 14, Illinois

Please send me my FREE copy of "5 Plans for Better Lubrication."

Name .....

Company .....

Address .....

City ..... State .....

ALEMITE

REG. U. S. PAT. OFF.

Ask Anyone in Industry

A PRODUCT OF SW STEWART WARNER

REVIEW FORECAST

Trade association executives predict excellent year ahead . . . Most report that despite rough spots last year turned out to be pretty good after all.

Industry Leaders See Business Gains

WHAT'S AHEAD?

Trade association executives report on outlook in these fields:

	Page
Brass mills	237
Boilers	237
Containers	238
Foundry	239
Freight cars	240
Furnaces	242
Gas	244
Heat treat	245
Identification	246
Lead	246
Magnesium	248
Malleable	250
Manganese	251
Metal Powders	252
Metal treating	245
Pressure pipe	253
Rail steel	255
Power	254
Rail bars	255
Scrap	256
Shipbuilding	257
Standards	259
Steel	260
Steel windows	261
Structural steel	262
Tin	263
Tools	264
Truck-Trailers	265
Welding	268
Wire	271
Wire fabric	270
Zinc	269

Alloy Castings:

Production expected to increase moderately in 1955.

E. A. Schoefer
Executive Vice-president
Alloy Casting Institute

During 1955 production of high alloy castings is expected to increase moderately from the 1954 level. The readjustment of demand, following the extremely high shipments of the Korean armament program, started in the latter part of 1953, but now appears to be about over. Shipments of heat and corrosion resistant iron-chromium-nickel castings in 1954 fell to roughly 75 pct of the 1953 output, reflecting the general decline in industrial production for the year.

Increased ordering of high alloy castings will doubtless come from the chemical processing, petroleum, heat treating and other industries where corrosion and high temperature processes are involved now that inventory adjustments have ben made and operations are on a more even keel. Continuing modernization programs in many industries will also create a demand for castings in new equipment. Expanded use of cast alloys in aircraft for both engines and air frames seems assured, and the requirements of nuclear power developments are just beginning to be explored.

Research by the Alloy Casting Institute and by individual members of the industry is going forward in the development of new and improved alloys for special service conditions. High alloys are being cast successfully by the shell-mold process; corrosion resistant castings of very low carbon content are available commercially; and heat resistant castings are finding increased application at extreme temperature ranges (above 2000F).

Aluminum:

Industry set another production record during 1954.

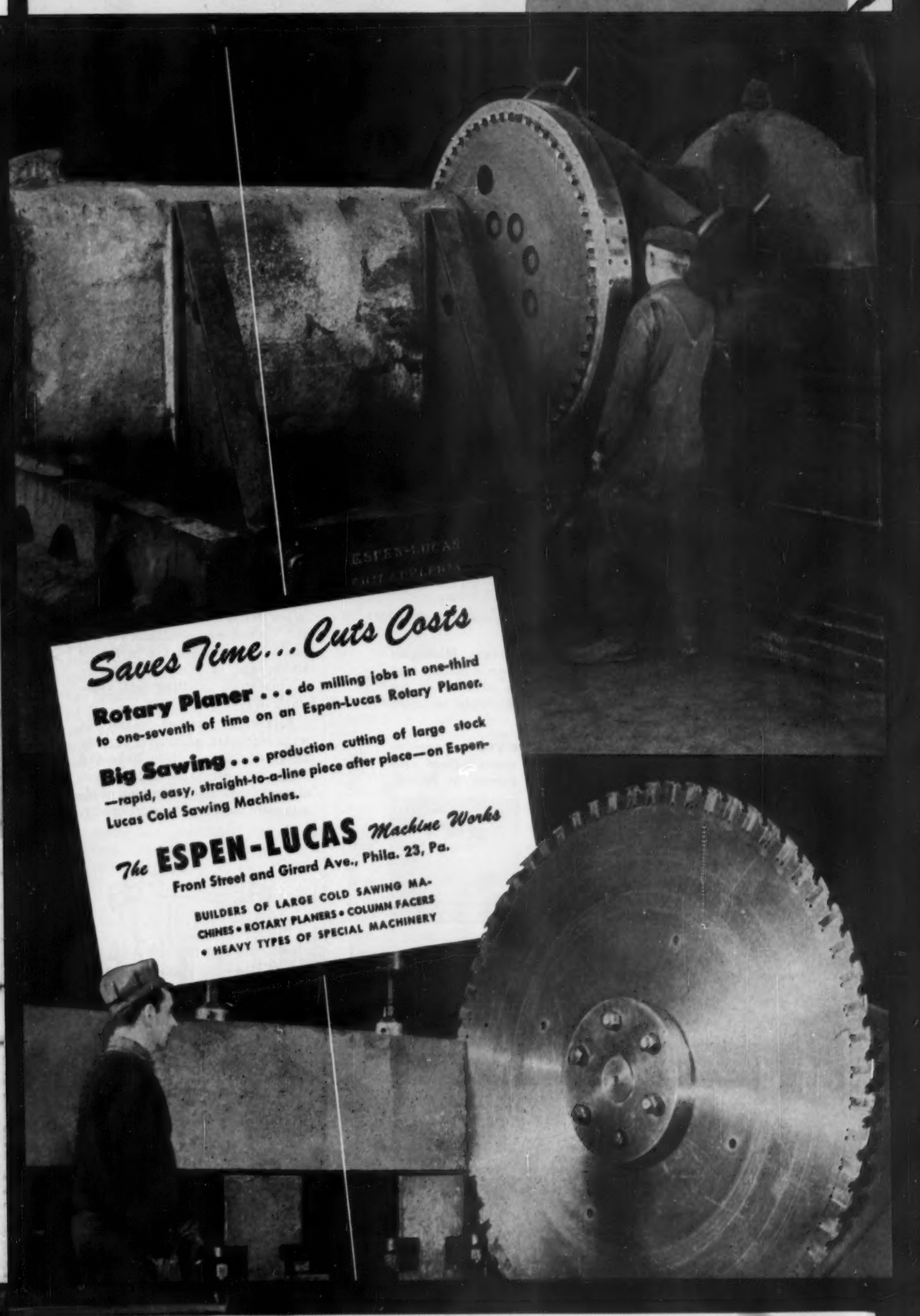
Donald M. White
Secretary
The Aluminum Assn.

Last year, like 1953, was a year of new records for the U. S. aluminum industry. Primary production, estimated on the basis of 10 months' figures, will be approximately 2,900,000,000 lb or 16 pct over the previous record set in 1953. On the same basis aluminum foil shipments were up 30 pct, to a total of about 150,000,000 lb. Industry leaders believe 1955 will be another record year.

Second Round Completed

Except for one reduction plant which is scheduled for operation early next year, the industry's so-called "second round" expansion is now complete.

Much new fabricating equipment was installed in 1954. Other units were under construction at year end and still others in the


Saves Time... Cuts Costs
Rotary Planer • • • do milling jobs in one-third to one-seventh of time on an Espen-Lucas Rotary Planer.
Big Sawing • • • production cutting of large stock —rapid, easy, straight-to-a-line piece after piece—on Espen-Lucas Cold Sawing Machines.
The ESPEN-LUCAS Machine Works
Front Street and Girard Ave., Phila. 23, Pa.
BUILDERS OF LARGE COLD SAWING MACHINES • ROTARY PLANERS • COLUMN FACERS • HEAVY TYPES OF SPECIAL MACHINERY

ROUND

¼" to 4" O.D. 7 to 22 gauge

SQUARE	Gauge	RECTANGULAR
⅜" to ½"	16 thru 22	¾" minimum side to 5" maximum side
¾" to 1"	11 thru 22	
1" to 2"	11 thru 20	
2" to 3"	11 thru 18	

Carbon 1010 to 1025

During nearly 40 years in business, Michigan has fabricated for its customers more than a billion feet of tubing. This is proof of Michigan's acceptance by industry as a major source of dependable modern electric resistance welded steel tubing.

No matter what your product, we urge you to consider the advantages in design, low cost manufacture and adaptability of Michigan tubing. It comes in round, square and rectangular shapes in a wide variety of sizes, and is of uniform strength, weight, ductility, ID and OD, machinability and weldability. Michigan tubing can be formed or machined in your plant, or prefabricated in ours. And, remember, Michigan tubing is *always* dependable.

Michigan engineers will welcome the opportunity to visit your plant and discuss the selection of tubing best suited to your product.

Michigan Tubing can be flanged, expanded, tapered, swaged, beaded, upset, flattened, forged, spun closed, fluted, and rolled.

RESISTANCE WELDED STEEL TUBING

Michigan STEEL TUBE PRODUCTS CO.

THE OLDEST NAME IN ELECTRIC

Nearly 40 Years in the Business

9450 BUFFALO ST. • DETROIT 12, MICH.

FACTORIES: DETROIT, MICHIGAN • SHELBY, OHIO

DISTRIBUTORS: Steel Sales Corp., Chicago, St. Louis, Milwaukee, Indianapolis and Minneapolis —Miller Steel Co., Inc., Hillside, N. J.—C. L. Hyland Co., Dayton, Ohio—Service Steel Co., Los Angeles, Calif.—Strong, Carlisle & Hammond Co., Cleveland, Ohio—Globe Supply Co., Denver, Colorado—W. A. McMichaels Co., Upper Darby, Pa.—A. J. Fitzgibbons Co., Buffalo, N. Y.—Harry E. Clark & Co., Houston, Texas—C. I. Crois Co., Birmingham, Ala.

planning stage. A 14,000-ton extrusion press, largest built to date, went into operation during the second quarter. Two 2,500-ton extrusion presses went into operation in the Pacific Northwest, and two new sheet rolling mills are being added at one of the plants in that area. Three more large forging presses are scheduled for the Los Angeles area. One producer has announced plans for a new major sheet and foil mill in West Virginia.

Main Events of 1954

Highlights of 1954 included: (1) Introduction of a new wrought alloy designation system; (2) initial operation of a new machine to produce 75-lb diecastings for the automotive industry; (3) new gains in the building field; (4) wider use in automobiles, notably in automatic transmissions; (5) growing use for street and traffic light standards; (6) increased use in low voltage wiring for buildings and telephone conductors; (7) small but expanded use in textile fibers; and (8) further gains in the materials handling field, especially in food processing.

Following another round of wage increases, aluminum pig was advanced 0.5¢ per lb to 20.5¢ and ingots 0.7¢ per lb to 22.2¢. Prices of most fabricated aluminum products were increased proportionally.

"Looks like Luigi brought grapes for lunch, again."

WHAT'S AHEAD

Brass Mills:

Geared to serve a growing demand for copper-base alloys.

T. E. Veltfort
Manager
Copper & Brass Research Assn.

With most economic forecasters looking to next year with optimism, and with an all-time record volume of construction predicted, the brass mills can reasonably expect a high, stable demand for their output. The increased use of copper and its alloys for "appearance" as well as usefulness, which began during 1954 as a definite trend, is expected to continue and grow during 1955.

I believe that the current status of our industry is typical of what has taken place in the whole economy: temporary dislocations and doldrums which affected the copper industry during the latter part of 1954 have been eliminated; copper supplies have become pretty well balanced with demand; and no difficulties in meeting the needs of American industry for these metals are anticipated. Brass mills will be in a positon to serve promptly and adequately any increased demand which is likely to occur next year.

Boilers:

Backlog, inquiries for steel boilers continue high.

R. A. Locke
President
Steel Boiler Institute, Inc.

During the past year the steel boiler industry has undergone normal expansion especially in the manufacture of residential steel boilers. The home building program has created an unusual demand for these boilers and the prospect for a continuing volume

On hydraulic applications
LATTICE BRAID* Flax Packing
holds together even when worn,
outlasts ordinary packings 3 to 1

*Registered Trademark. Only Garlock makes LATTICE BRAID rod and shaft packings.

Check these typical service reports:

- *Locomotive Manufacturer*—Hydraulic pumps handling water, 1,500 to 2,000 p.s.i. Garlock 745 LATTICE BRAID Flax packing gives from 4 to 12 months service where previous braided packings lasted a maximum of a few weeks.
- *Steel Company*—Hydraulic accumulator handling cold water, 5,000 p.s.i. Best service from previous packings 6 weeks to 2 months. Garlock 745 LATTICE BRAID Flax packing lasts 6 months, rings form better in stuffing box, do not tear in service.
- *Rubber Company*—Hydraulic presses handling water, 160° F., 2,100 p.s.i., ¾" packing, plungers worn and rough. Maximum service from previous packings 1 month. Garlock 745 LATTICE BRAID Flax packing lasts 4 months.
- *Steel Company*—Hydraulic accumulator handling water, 800 p.s.i., 48" ram, 1" packing. Previous packings lasted 6 to 8 months. Garlock 740 LATTICE BRAID Flax packing gives 2½ years service.

Get all the facts about LATTICE BRAID *Packings. Contact your Garlock representative or write for new folder AD-131.*

THE GARLOCK PACKING COMPANY, PALMYRA, NEW YORK

Sales Offices and Warehouses: Baltimore • Birmingham • Boston • Buffalo • Chicago • Cincinnati • Cleveland Denver • Detroit • Houston • Los Angeles • New Orleans • New York City • Palmyra (N.Y.) • Philadelphia Pittsburgh • Portland (Oregon) • Salt Lake City • San Francisco • St. Louis • Seattle • Spokane • Tulsa.

In Canada: The Garlock Packing Company of Canada Ltd., Toronto, Ont.

GARLOCK LATTICE BRAID PACKING

Operator removing completed ceiling diffuser ring from Farquhar Hydraulic Press at Tuttle & Bailey, Inc., New Britain, Conn.

Tuttle & Bailey reports:

FARQUHAR HYDRAULIC PRESS Makes New Product Possible

Tuttle & Bailey, Inc., New Britain, Conn., produces heating convectors, ceiling diffusers, grilles, registers, etc., as well as several defense products for the United States. When production of the ceiling diffusers was first planned, the company found they could not be manufactured with existing equipment at their plant.

Tuttle & Bailey then consulted with various hydraulic press companies, searching for a design to meet their requirements. Finally, the A. B. Farquhar Company came up with the best design—*and at the lowest cost*—a 450-ton press with pressing ram speed of 0 to 45 in./min., approach and return speed of 390 in./min., and an operating hydraulic pressure of 2650 lbs./sq. in.

The company is very pleased with Farquhar's low maintenance cost, too. The press was installed in Aug. 1950, and has required no maintenance other than occasional gasket replacement.

Farquhar Presses Cut Your Costs

The above installation is just one more example of Farquhar performance in heavy production! Farquhar Presses are built-for-the-job . . . assure faster production due to rapid advance and return of the ram . . . greater accuracy because of extra-long guides on the moving platen . . . easy, smooth operation with finger-tip controls . . . longer life due to positive control of speed and pressure on the die . . . long, dependable service with minimum maintenance cost!

For our free catalog showing Farquhar Hydraulic Presses in all sizes and capacities for all types of industry, write to: THE OLIVER CORPORATION, A. B. FARQUHAR DIV., Hydraulic Press Dept., 1503 Duke St., York, Pa.

Farquhar
HYDRAULIC PRESSES
for Bending • Forming • Forcing • Straightening • Assembling • Drawing
Extruding • Jogging • Forging • and other Metalworking Operations

THE OLIVER CORPORATION • A. B. FARQUHAR DIVISION

of this business in 1955 is very bright.

This industry wound up the year 1954 with shipments equal to 99 pct of the shipments of 1953. In these shipments residential boilers and the low pressure commercial heating boilers have exceeded the shipments of 1953 whereas high pressure boiler shipments were somewhat less.

Reports which we have received indicate that a substantial backlog of business will be carried over into 1955 and inquiries for boilers to be delivered in 1955 have been of considerable volume.

Containers:

Treble output of steel shipping containers since 1940.

Livingston Keplinger
President
Steel Shipping Container Institute

The steel shipping container industry has practically trebled its production since 1940, and while a few new plants are being brought into production and others modified, there is no tangible dollar program underway.

Prospects for 1955 will follow very much the general business pattern and demands of its four major industries—petroleum, chemical, food, and paint, varnish and lacquer.

Light gage gains

In 1954, volume in units was approximately the same as in 1953, except for a 5 to 10 pct decline in containers of 18-gage and heavier steel brought about by the diminishing military requirements. Containers of 19-gage and lighter steel will be slightly ahead of 1953, and containers of 1 to 12-gal capacity will show an increase of approximately 10 pct over 1953.

The steel shipping container industry increased its funds for research at Battelle Memorial Institute during the current year of 1954, and will continue the program through 1955.

WHAT'S AHEAD

Foundry:

Equipment makers expect first quarter pickup in orders.

C. R. Heller
Executive Secretary-treasurer
Foundry Equipment Mfrs. Assn.

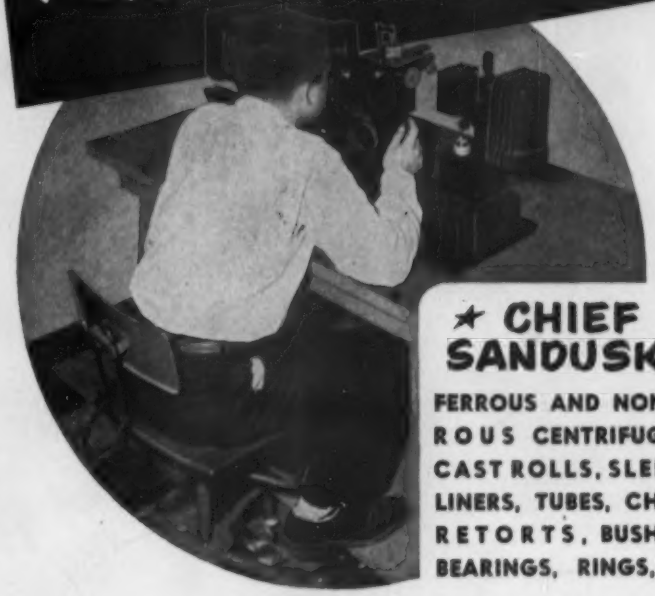
Responses by our members to the question, "Are you planning any capital investment program for 1955, involving expansion or modernization of your plant and equipment?"—32 pct of the firms indicated YES, and 68 pct indicated NO. In response to another question, a vast majority of FEMA members indicated that their present capacity would be adequate for their anticipated 1955 rate of activity.

FEMA statistics revealed that "New Equipment Orders Closed" in 1954, January through September, were running at an annual rate equal to 67 pct of the 1953 annual rate. 1954 "New Equipment Orders Closed" are running at an annual rate of 84.5 pct of the FEMA 1947-49 base period (unadjusted).

Analysis of the source of FEMA orders in 1954 revealed that 43 pct of "New Equipment Orders Closed" were purchased for the purpose of increasing capacity—57 pct were for modernization. For 1955 it was predicted that the fac-

"Take it easy. Thebes wasn't built in a day either."

NOW--LOOK TO CHIEF SANDUSKY FOR FERROUS TOO!



★ CHIEF ★ SANDUSKY

FERROUS AND NON-FERROUS CENTRIFUGALLY CAST ROLLS, SLEEVES, LINERS, TUBES, CHUTES, RETORTS, BUSHINGS, BEARINGS, RINGS, ETC.

With the recent installation of high-frequency induction melting furnaces, Chief Sandusky now supplies industry with a diversified line of both ferrous and non-ferrous cylindrical castings. In addition to the convenience of single-source supply, we provide sound technical assistance from both the field and greatly expanded laboratory facilities.

With a skill born of 40 years' experience, time tested in hundreds of plants, you can call on our experienced technicians with confidence. They're ready to help you with manufacturing special castings to specification or working with your staff in developing unusual types to solve new problems.

Look to Chief Sandusky as a continuing dependable source of both ferrous and non-ferrous custom quality centrifugal castings.

C. M. LOVSTED & CO., SEATTLE, WASH. • TYNE BROS., BIRMINGHAM, ALA. • CORDES BROS., SAN FRANCISCO AND LONG BEACH, CALIF.

SANDUSKY FOUNDRY and MACHINE CO.

615 W. Market Street Sandusky, Ohio

T-J

OFF SHELF DELIVERY!

Spacemaker

CYLINDERS

★ OIL pressure to 750—AIR to 200 P.S.I.
★ New Compact Design . . . Saves up to 40% Space
★ Proven Performance . . . with Extra High Safety Factor
★ Super Cushion Flexible Seals for Air . . . New Self-Aligning Adjustable Oil Cushion
★ Hard Chrome Plated Bodies and Piston Rods

Compare feature by feature—you'll see why T-J Spacemaker Cylinders are today's top choice for streamlined power movement in automation! The only cylinder with all the extras as standard. Write for bulletin SM-454-2.
The Tomkins-Johnson Co., Jackson, Mich.

T-J TOMKINS-JOHNSON

tor of modernization will account for an even bigger percentage of orders.

A substantial majority of members reported that an increase in new equipment orders was anticipated for the first quarter of 1955, compared to orders received during the third quarter of 1954. This was considered to be significant —indicating that the year-long downward slide in FEMA new orders was about to be reversed.

An open forum discussion brought out the following points: (1) A decided majority of the membership felt that the new, revised depreciation rules would be a definite, long-run stimulant to FEMA business activity; and (2) a majority of the membership felt that the downward slide in foundry castings production was at an end, and that even a slight reversal of this trend would serve to restore business confidence in the foundry industry, thus permitting modernization spending plans to go ahead in 1955.

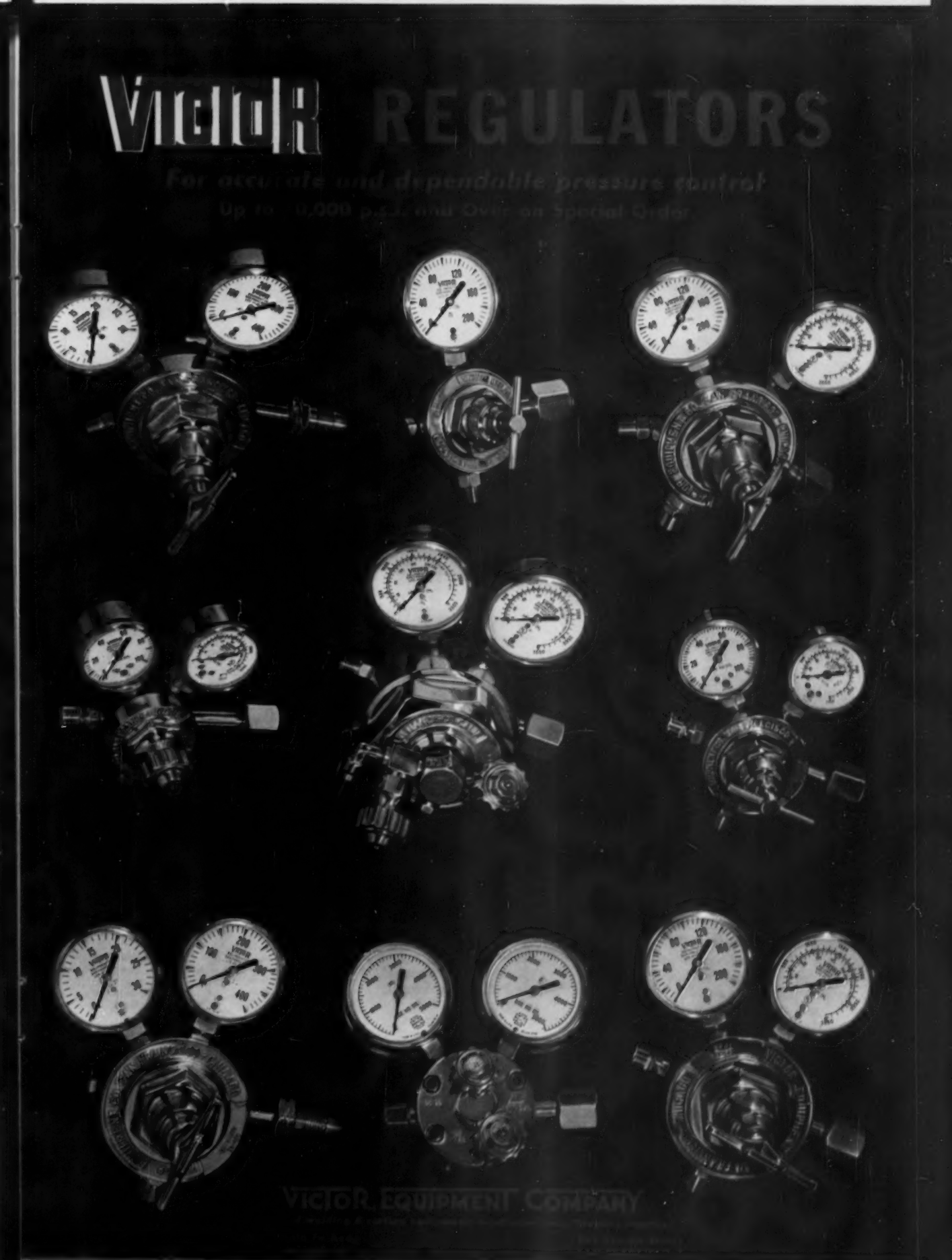
Freight Cars:

Past was gloomy, future is only slightly brighter.

G. Metzman
Past Board Chairman & President
American Railway Car Institute

Outlook for the commercial car building industry is that the present is grim but there's some hope for improvement in the future.

Backlog of freight car orders for independent car builders amounted to 8677 units on Dec. 1 last year. This could be wiped out in only one month of single shift production. New orders received by commercial car builders last year up to December totaled 13,100 cars, about half the amount ordered during the same periods in 1952 and 1953 and less than one-fifth the industry's average over the last 10 years. This is why car building is frequently grouped in the sick industry category.


VICTOR REGULATORS
For accurate and dependable pressure control
Up to 10,000 p.s.i. and Over on Special Order
VICTOR EQUIPMENT COMPANY

"Look at the range of sizes of
TORRINGTON NEEDLE BEARINGS"

The Torrington Needle Bearing is produced in a wide range of sizes—for shaft diameters from ⅛" to 7¼"—to meet the needs of the thousands of products throughout industry in which it has become standard equipment.

Whatever the size, the basic design is the same—a full complement of free running rollers, without separators or cages, retained by a thin hardened outer shell which serves as the outer race. This means a greater radial load capacity for its size than any other anti-friction bearing, plus compactness and long, maintenance-free operation.

Several widths are available in each size to meet specific design requirements, and they are also made with one end closed for use over stub shafts.

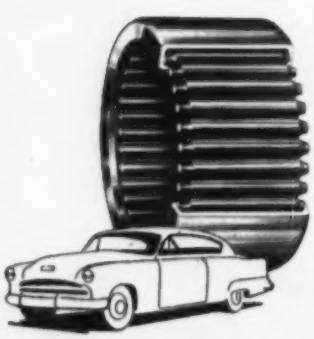
The Torrington Company has engineered thousands of different Needle Bearing applications in many industries during the bearing's 20-year history. Our Engineering Department offers the benefits of this experience in applying Needle Bearings to your products.

THE TORRINGTON COMPANY
Torrington, Conn. South Bend 21, Ind.

District Offices and Distributors in Principal Cities of United States and Canada

TORRINGTON NEEDLE BEARINGS

Needle • Spherical Roller • Tapered Roller • Cylindrical Roller • Ball • Needle Rollers



America's leading automobile makers use millions of Torrington Needle Bearings a year in steering gears, transmissions, universal joints and many other assemblies. Needle Bearings install easily, give long service life, help contribute to safer handling, smoother riding and braking to cars and trucks.

Looking for a Stainless Steel with a *New* combination of properties?

Here is a radically different chrome-nickel stainless developed by Carpenter to give you this unusual combination of fabricating and product benefits . . .

. . . work hardens *much slower* than any of the conventional 18-8 grades

. . . remains *non-magnetic* after severe cold working

. . . possesses corrosion resistance *equal to* or *better than* standard chrome-nickel stainless steels

This unusual combination of advantages is one reason why Carpenter *Stainless No. 10* is earning a unique place among engineered materials.

For example, it has opened whole new fields of applications in the fastener industry. With its slower work-hardening, fastener manufacturers can now produce on automatic machines severely cold headed and upset chrome-nickel stainless parts without process annealing. *No. 10* is also proving its economy on other jobs involving difficult coining, extrusion and swaging operations.

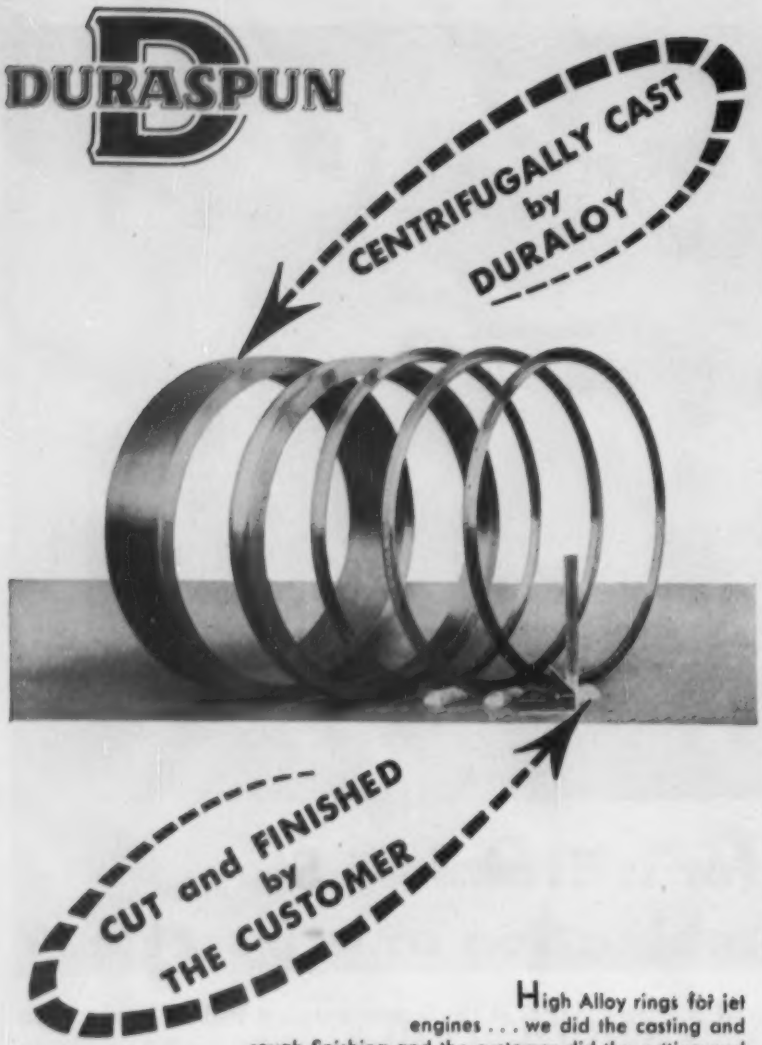
Another example is instrument parts which must remain non-magnetic after fabrication. After a 50% reduction, with a field of 200 Oersteds, permeability is about 1.002. After an 80% reduction: about 1.018. Will you be *next* to benefit from *Stainless No. 10?* How can *your* stainless product be improved, production simplified, costs lowered? Get the complete story on *No. 10.* Just drop us a line on your Company letterhead. THE CARPENTER STEEL CO., 121 W. Bern St., Reading, Pa.

Carpenter STEEL

Stainless No. 10

take the problems out of production.

Pioneering in Improved Tool, Alloy and Stainless Steels Through Continuing Research
Export Department: The Carpenter Steel Co., Port Washington, N.Y.—"CARSTEELCO"



High Alloy rings for jet engines . . . we did the casting and rough finishing and the customer did the cutting and final finishing.

Centrifugally cast metal gives an exceptionally fine, dense, uniform grain structure. The strength of the metal approaches that imparted to a bar or ingot when it is hot forged. It produces an ideal metal for the tough service required of jet engine parts.

Incidentally, as evidence of our knowledge of and experience with tough alloy castings — static as well as centrifugal — the records show very few rejections by this engine manufacturer who subjected each of the many rings we furnished to his own very rigid tests.

May we suggest that you let Duraloy work on your high alloy castings — chrome iron, chrome nickel or nickel chrome? We have the experience and facilities for turning out high quality castings.

THE DURALOY COMPANY

Office and Plant: Scottdale, Pa. • Eastern Office: 12 East 41st Street, New York 17, N.Y.

Detroit Office: 7310 Woodward Avenue • Pleasant Ridge, Mich.

Atlanta: J. M. TULL Chicago: F. O. NELSON Metal & Supply Co. 332 S. Michigan Avenue

METAL GOODS CORP. Dallas • Denver • Houston • Kansas City • New Orleans • St. Louis • Tulsa

But the odds are this year won't be so bad as 1954. Big factors in the '54 decline were the general economic recession and the dip in railroad traffic which through the first 11 months of 1954 was running about 12.7 pct behind 1953. What will be different in 1955 is that the economy is showing a definite uptrend and there should be a pickup in freight car loadings as a result.

Other factors which should help the car builders is the increase in the number of cars in need of repairs and the fact that freight cars have been retired faster than they have been replaced. Nevertheless, it is doubtful that freight car demand in 1955 will equal the industry's sharply declining capacity.

It is expected that rail traffic and earnings will probably show some improvement both this year and next, but there is no certainty the railroads can hold their present competitive position. Importance of railroads in the economy is diminishing and they will continue to have difficulty in turning this trend.

Heating:

Prospects in '55 look good to industrial equipment makers.

Carl Ipsen
Executive Vice-President
Industrial Heating Equipment
Manufacturers Assn.

Gazing into the crystal ball to see what business conditions will be like in 1955, makers of industrial heating equipment surveyed by their association have come up with a composite forecast that things will be reasonably good in 1955. Forecast predicts a slight gain over 1954, which was a pretty good year for the industry. During the first full peace-time year since the Korean war, members of the Industrial

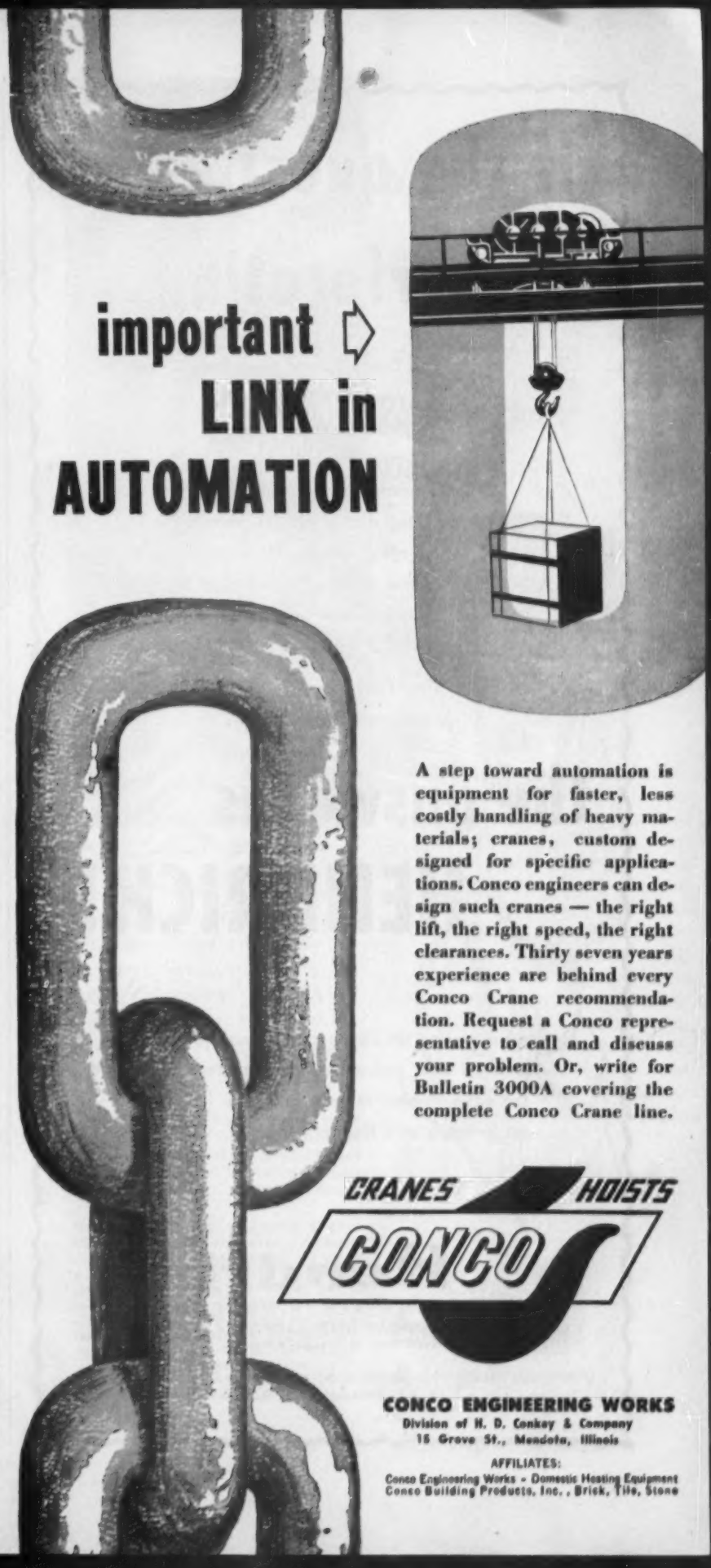
Heating Equipment Assn. have fared better than most durable goods industries.

Figures tell the story best:

Year	Index of Orders (Furnaces, ovens and combustion equipment)
1945-47	100
1951 (Korea maximum)	331
1953	233
1954	163
1955 (composite forecast)	169

Technical advances highlighted 1954. Some of the more important of these include: (1) Refinements in carbon potential control. These make possible automatic control of furnace atmospheres to accurately create or maintain surface carbon of parts being heat treated; (2) advances in automation in industrial heating equipment; (3) increased output with better uniformity have been attained on large new batch and continuous strip annealing furnaces for ferrous and nonferrous metals; (4) production sized vacuum melting furnaces were produced to meet the rapidly growing demand for high purity metals with increased physical properties; (5) vacuum heat treating and melting furnaces for titanium, molybdenum and zirconium; and (6) dual frequency for the more economical heating of forging billets and increasing use of 60 cycles for heating billets. One 60-cycle induction heater is heating stainless steel billets to 2400°F.

"He'll walk all over you, if he gets the chance."



important ⇨ LINK in AUTOMATION

A step toward automation is equipment for faster, less costly handling of heavy materials; cranes, custom designed for specific applications. Conco engineers can design such cranes — the right lift, the right speed, the right clearances. Thirty seven years experience are behind every Conco Crane recommendation. Request a Conco representative to call and discuss your problem. Or, write for Bulletin 3000A covering the complete Conco Crane line.

CRANES HOISTS

CONCO

CONCO ENGINEERING WORKS
Division of H. D. Conkey & Company
15 Grove St., Mendota, Illinois

AFFILIATES:
Conco Engineering Works - Domestic Heating Equipment
Conco Building Products, Inc., Brick, Tile, Stone

if the question is perforating...

Ever stop and think that the answer to your design problem may be simple perforations? Whatever material you're working with, if it's metal, masonite, rubber, plastic, hard or insulated board for decorative or display usage, Hendrick can help you. Over a period of many, many years Hendrick has built up the largest stock of dies commercially available.

If you are faced with the need for perforated materials

the answer is HENDRICK!

or if you would like more information on how perforating can enhance the sales appeal of your products, get in touch with Hendrick today.

Hendrick
MANUFACTURING COMPANY
37 DUNDAFF STREET, CARBONDALE, PA.
Sales Offices in Principal Cities

Perforated Metal • Perforated Metal Screens • Wedge-Slot Screens • Architectural Grilles • Mitco Open Steel Flooring • Shur-Site Treads • Armorgrids

Gas:

Industry aims at beating records it set last year.

F. M. Banks
President
American Gas Assn.

The gas utilities and pipeline companies in the United States achieved new record levels in customers served, revenues, and volume of sales during 1954. There is every reason to expect that the present records will be met and new records established in 1955. The industry expended about $1.2 billion for new construction and expansion of present facilities during 1954. It is estimated that in the four years between 1954 and 1958 a total of $4 billion will be spent by the utilities and pipeline companies on new construction. Investment in gas construction is expected to average nearly $1 billion a year for the next two years.

Last year nearly 18,000 miles of pipeline were added to the nation's system of gathering, storage, transmission and distribution lines. This lifted the total natural gas pipeline mileage to about 413,000 miles. When the more than 50,000 miles of manufactured and mixed gas distribution pipelines are added, the gas industry has about 463,000 miles of pipe underground in the United States; enough to circle the globe 18 times.

Steel Needs Heavy

The gas industry will require 4.6 million tons of steel pipe during the 1954-1957 period inclusive. Of this amount, 2.9 million tons will be in the form of 16-in. diameter and over, primarily for gas transmission lines. An additional 134,000 tons of steel in other forms and 446,000 tons of cast iron will be required by the industry during this period.

Mr. Banks is president, Southern California Gas Co.

WHAT'S AHEAD

Heat Treat:

Took '54 dip in stride . . . See steady rise this year.

C. M. Cook
President
Metal Treating Institute

Commercial heat treating, as a recognized segment of the metalworking field, is a young and rapidly growing industry. It has not begun to reach its full potential and because of its youth is able to take minor setbacks in its stride. 1954 was a setback. But it was neither unexpected nor overly serious. Sales in most areas of the country dropped back about 25 pct between January '54 and July '54. Some of this loss will have been recovered during the last quarter of the year and a steady increase is expected during '55.

Reshuffling in Progress

A re-shuffling is in process which will account for much of the sales increase expected throughout the industry. Until recently, many manufacturers have operated their own facilities without regard to accurate costing and in many cases being satisfied with a generally lower standard of work. This situation is not peculiar to the heat treating industry—it exists in the fields of plating, stamping, casting, forging, tool and die work and many others. As the changing sales picture has demanded greater economy in production without sacrificing quality, management in most cases is reviewing inefficient or uneconomical production operations with an eye to eliminating them and contracting for outside services.

The field of metal treating is continually expanding in the way of new processes, new materials and new equipment. For example, hard surfacing treatments for aluminum, new coatings for iron and steel, the development of new,

Perkins . . .

"Custom tailors" **to cost-conscious Design Engineers**

WHETHER that cost is "first" or "operating" it will pay dividends to investigate the saving possibilities of having the gears in your products custom-made by PERKINS — one of New England's oldest and ablest gear-engineering organizations.

PERKINS MAKES:

to customers' specifications, in all materials, metallic and non-metallic: bevel gears, ratchets, sprockets, ground thread worms, spiral gears, helical gears, spur gears with shaved or ground teeth.

NOTE: The PERKINS PRECISION SPRING COILER is the latest development in the spring coiler field and eliminates entirely the use of arbors and long set-up time. It is a complete self-sufficient machine and enables you to make the spring you want when you want it — in seconds. The coiler produces any type of spring, in any diameter and any pitch with this range: Wire sizes .005 to .125. Diameter, from 3/32" to 12" and larger. Size of the compact coiler is only 7 1/2 x 16". A POWER MODEL is available. Information on request.

Perkins Machine & Gear Company
101 Circuit Avenue
WEST SPRINGFIELD, MASS.

Edmont Case No. 502: Handling lumber, vitrified tile, etc., Edmont job-fitted gloves with coated palms outwore canvas up to 10 times, gave safer grip and protection against hand injury.

Safer work handling with job-fitted gloves

No. 42W Grab-It rough rubber coated

No. 151 Plax plastic impregnated

. . 3 TO 10 TIMES LONGER WEAR

By fitting the glove to the job, you can substantially reduce lost-time accidents due to hand injuries. At the same time, you effect cost savings of 40% to 70% through longer wear, and improve employee comfort and morale.

Edmont makes over 50 standard types of gloves, palm coated or fully-coated with Neox (reinforced neoprene), natural rubber or vinyl plastic coatings. There's a type for practically every handling requirement including resistance to cutting, abrasion, oils, greases, acids, caustics, solvents, degreasants, extremes of heat and cold, etc. Our laboratory also develops special types for special conditions.

Edmont Case No. 208: Handling explosives in fiber cases, Edmont palm coated Grab-it gloves outwore leather palm gloves 3 to 1 and gave positive non-slip grip at all times.

Edmont Case No. 356: In handling laminated plastic, leading appliance manufacturer found Edmont's new PLAX gloves (light plastic-impregnated fabric) outwore canvas 4 times, and gave better protection against sharp edges.

FREE JOB-TEST OFFER: Send us a description of your operation, materials handled and temperature condition. Without cost, we will recommend the correct glove and send free samples for you to job-test.

The Edmont Manufacturing Co., 1334 Walnut Street, Coshocton, Ohio

World's largest maker of coated industrial gloves, available through leading industrial suppliers.

Edmont

Edmont job-fitted gloves

more easily heat treatable titanium alloys, greater demand for controlled atmospheres and faster processing equipment.

Mr. Cook is president, Cook Heat Treating Co.

Identification:

Marking device business may come close to 1953 level.

Elmer F. Way
Secretary and General Manager
Marking Device Assn.

We are a small and rather stable industry, doing about 55 or 60 million dollars a year business. Marking devices are not exactly like washing machines, and you can't stir up additional sales by delving into new markets.

This is not 100 pct true, but it's largely true; therefore, we don't look for any particular spectacular expansion. We have the capacity for expansion, but by and large we're an industry of craftsmen and not high pressure salesmen, and that does not make for very rapid expansion, although it does make for a healthy, steady growth.

1954 varied from about 10 pct to what is now 5 pct below 1953. We anticipate that 1955 will just about bring us in line with 1953, an extremely good year for our industry.

Lead:

Battery, building demand promise good demand in 1955.

R. L. Ziegfeld
Secretary-Treasurer
Lead Industries Assn.

The 1955 outlook for lead appears favorable. Consumption by the storage battery industry, disappointing in 1954, was estimated for 1955 at the recent meeting of the Association of American Bat-

tery Manufacturers to run some 11 pct ahead of 1954. Since this use accounts for about 30 pct of total consumption, such improvement, if correctly forecast, would be important.

Tetraethyl lead, the second largest use, continues to be a bright spot. It probably consumed at least 5 pct more lead in 1954 than in 1953, with 1955 destined to show continued steady growth. Likewise, there is little, if any, sign of abatement in the booming building industry in 1955 and this is another very important lead consumer.

New Uses May Help

Two comparatively new uses of lead which may contribute materially to lead consumption in the long run are for nuclear radiation shielding and as a principal ingredient of porcelain enamels for aluminum. Successful porcelain enamels so far developed for aluminum contain from 30 to 50 pct lead. There is good reason to expect that the use of this material for building facades, signs, interiors of ships and many other purposes will reach sizable proportions in time.

World reserves of lead are considered ample by experts and have not been reduced in recent years despite heavy production. In fact sizable reserves have been added in the last couple of years, particularly in Canada.

In 1953 the lead consuming in-

"He's a sort of poor man's poor man."

Ready-Power Continuous-Duty

DIESEL ELECTRIC

POWERS INDUSTRY'S LARGEST LIFT TRUCKS

AMAZING DURABILITY!

UNBELIEVABLE ECONOMY!

This 80,000-lb. twin ram lift truck, operated in one of America's largest steel mills, is equipped with interchangeable Ready-Power diesel electric model RD-18. Continuous duty full power is assured *at all times.* The low operating and maintenance costs attained are possible only through the use of diesel-electric drive. Ready-Power offers a full range of diesel electric and gas-electric models for all truck sizes. *Write for complete information.*

READY-POWER

The READY-POWER Co., 3822 GRAND RIVER AVE., DETROIT 8, MICH.

Manufacturers of Gas and Diesel Engine-Driven Generators and Air Conditioning Units; Gas and Diesel-Electric Power Units for Industrial Trucks

Look overhead..see "NORTHERN"

NORTHERN **CRANES** *for severe service! for continuous operation! for safety and economy!*

The 40-ton NORTHERN SUPER CRANE shown is one of several Northern cranes operating in the Huntington Works of the International Nickel Company.

From drawing board to assembly floor no effort is spared in building uninterrupted service into NORTHERN HEAVY DUTY SUPER CRANES. They are built to stand rough handling, overloading and continuous operation. Mechanically, structurally and electrically they offer the maximum in safety and operating efficiency.

Northern Cranes are backed by over 55 years experience in designing and building cranes for steel mills, metal fabricating plants, automobile plants, paper mills, electrical manufacturers, railroads, and many other industries.

Let us send you Bulletin SE-108

NORTHERN **CRANES—HOISTS—TRAVELATORS**

NORTHERN ENGINEERING WORKS
210 CHENE ST., DETROIT 7, MICH.

dustry ran at near record levels while paradoxically the producing branch was suffering from an oversupply of metal that brought a sharp drop in prices. In 1954 the position reversed itself somewhat; consumption fell some 10 pct, yet producer's prices recovered moderately.

This reversal resulted from a number of factors. Production was cut as a result of low prices in late 1953 and early 1954, European demand improved materially and removed from the American market some of the heavy imports that had come in during 1953, and the United States Government resumed stockpile purchases. At the same time consumption contracted moderately in line with the contraction in general business activity.

Magnesium:

Sales upturn in cards after passing last year's low.

Jerry Singleton
Executive Secretary
The Magnesium Assn.

The year just ended held few bright spots for the magnesium industry. But it is fair to say that it was not so bad as many feared it might be. Primary production was off just under 25 pct. Casting shipments were hardest hit, fell about 28 pct, while shipments of wrought products dropped only 23 pct. Generally, the industry had expected drops of over 33 pct in all classes.

Low has Passed

Most important single development was the indication that the low has been passed and that the trend is currently upward, with expectations that the industry will reach 1955 totals at least 15 pct above the 1954 figures except for ingot production which should hold at the current rate.

Opening of the largest magnesium mill in the world at Madison, Ill., by Dow was the chief accomplishment of the year. While this did not change the industry overnight, it is felt to bode well for the future despite preliminary production difficulties of a technical nature. It is felt that this plant will demand greater selling effort to support its output at a profitable level, on the one hand, while operating economies should be reflected in price adjustments which in turn will improve magnesium's competitive advantage over heavier metals.

Still A Dark Cloud

Increased requests for quotations and evidence of greater technological interest are taken as indicating greater industrial concern with both present application and future potential of this lightest of structural metals.

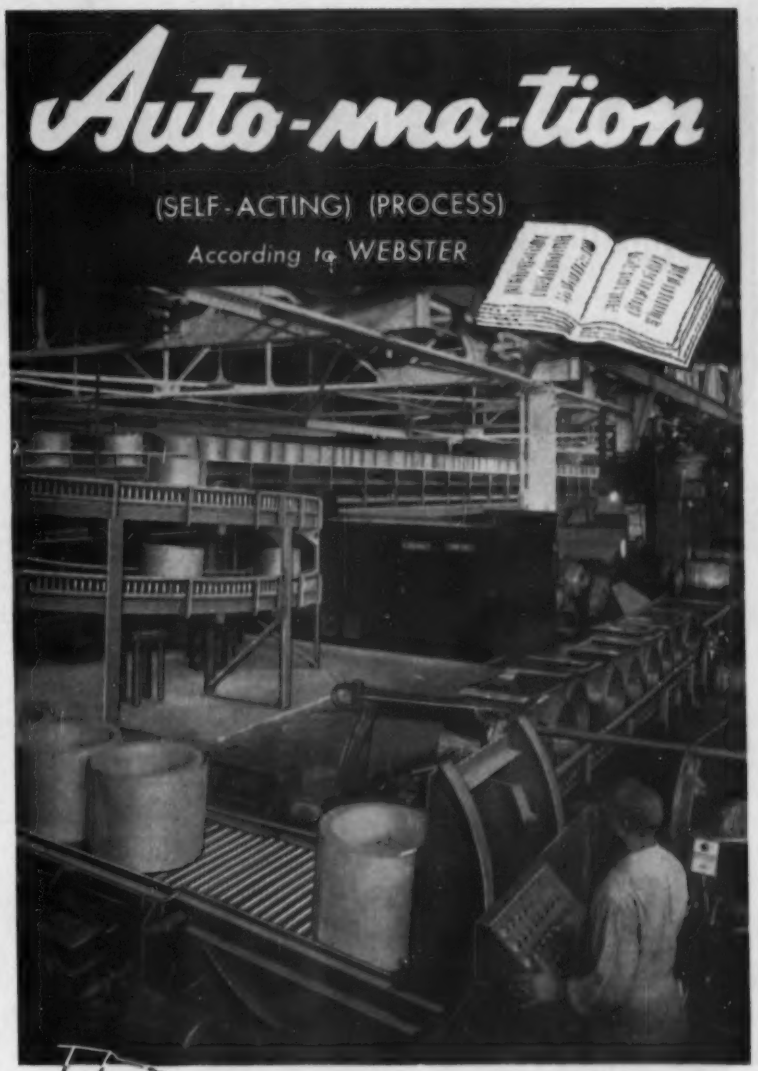
Only dark cloud for 1955 is that seen in the threat to close the government-owned Velasco, Tex., producing plant for want of a buyer other than Dow, current operator whose bid has been frowned upon by Justice Dept. Should Velasco be closed, production could drop below current consumption rate. Actually this closing is considered most unlikely.

"I think we've struck ore."

Auto-ma-tion

(SELF-ACTING) (PROCESS)

According to WEBSTER



Finger tip controls operate this Logan Downender handling heavy brass coils. Feed from overhead Roller Slat Conveyor in rear via Roller Spiral is also remote controlled by series of stops and air operated brakes. Similar units serve pickling.

The push-button plant may be nearer than we think! Already, Logan has installed literally miles of conveyor where the flow of material is guided by remote control. And automatic feed to machines from conveyor — and back to conveyor again — is no novelty in Logan-engineered installations.

As this modern conception of plant operation grows and expands, one thing is sure — Logan engineering will be found in the vanguard of the movement. Every conveyor job is, in reality, a step toward automation.

What are your material handling needs? Write today for literature or for the nearest Logan engineer to call.

LOGAN CO., 545 CABEL ST., LOUISVILLE, KY.

Logan Conveyors

APEX has the tools you need to drive Phillips screws

(and Frearson, Slotted, Clutch Head or Socket Head screws, too!)

Using Phillips screws on your fastening operations? Then you'll want to know more about Apex tools for driving Phillips screws.

Power bits, bit holders and insert bits, hand drivers, service drive bits, offset drivers, hand brace bits—Apex has them all, for all sizes of Phillips screws.

For production screwdriving, using air or electric power tools or manual methods, there's an Apex tool exactly fitted to your requirements. Catalog 21—the authority on screwdriving—can help you. Write, on your company letterhead please, for your copy.

APEX screwdriving tools

THE APEX MACHINE & TOOL CO.
1029 Patterson Blvd. • Dayton 2, Ohio

Malleable

Total shipments off 11 pct
Big boost in pearlitic.

C. E. Brust
President
Malleable Founders' Society

Present indications are that 1954 total shipments will be about 11 pct lower than for 1953. The 1953 total was the second biggest in our history, 1951 being the highest. Probably the outstanding event of the year in this field has been the increased interest in and demand for pearlitic malleable castings. Some small to medium size companies have experienced quite a shift in production, to the extent that pearlitic malleable castings now account for a third or more of their shipments, whereas, as recently as 2 or 3 years ago, pearlitic accounted for 5 to 15 pct of such shipments.

There is a tremendous interest in this product in the automotive any many other industries. For many applications, it seems to have the necessary combination of ductility (when required), machinability and other properties. The fact that it lends itself well to flame or induction hardening has also been helpful.

My best guess is that production this year will be more than double what it was in 1948, and will approach 100,000 tons shipped.

"And now for the financial report . . ."

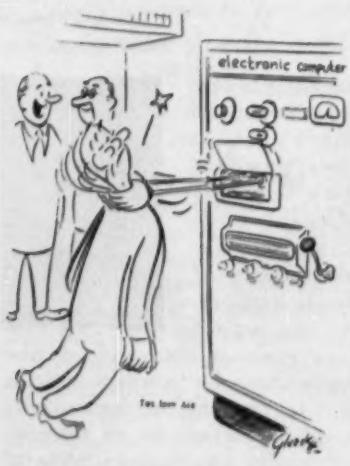
Manganese:

U. S. supplies grow . . . Federal aid boosts home output.

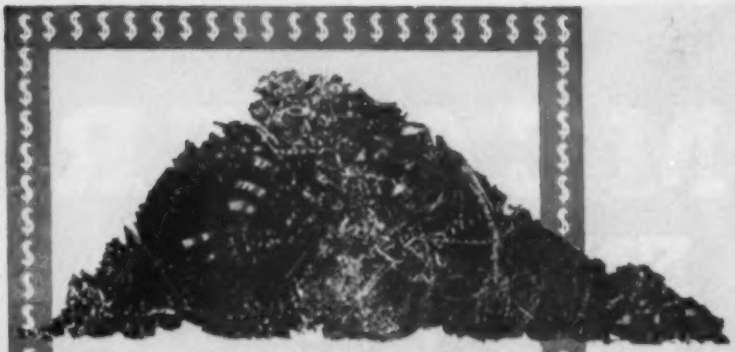
J. C. Adkerson
President
American Manganese Producers Assn.

Manganese supply situation eased considerably in 1954. Imports dropped from the 1953 alltime record but were well over the requirements for reduced steel production. Domestic mine shipments continued to respond to encouraging government programs but still represent only 10 pct of U. S. needs. Adequate stocks and reduced use contributed to easy ore and ferromanganese markets throughout 1954. Price of standard 46-48 pct Indian ore, c. i. f. U. S. ports excluding duty, dipped from $1.10 per long ton unit to less than 75¢ by September. Ferromanganese prices were cut $10 per net ton in September. But the government incentive price for small shippers under the car lot program stayed at $2.30 for 48-pct ore.

Program guaranteeing this price until June 30, 1958, or until 19 million long ton units have been delivered promises to continue until the terminal date. The 6 million



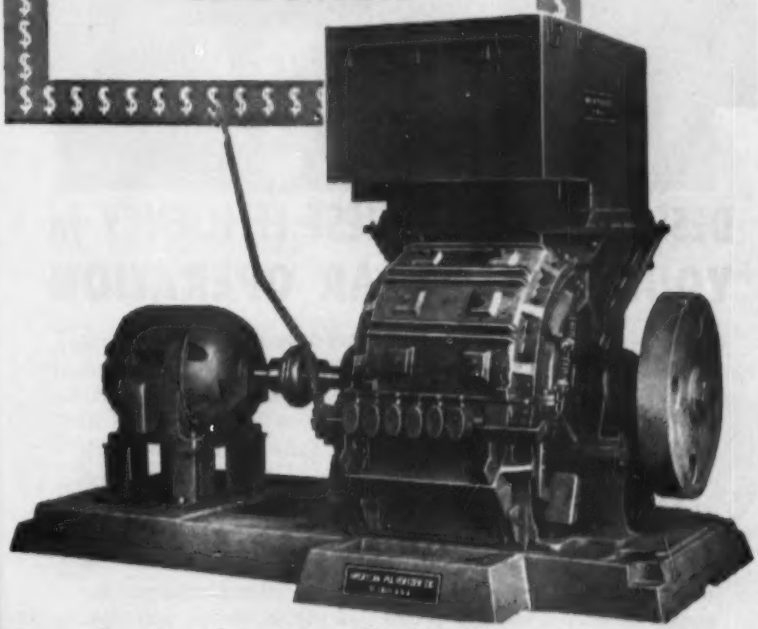
"Stupidity annoys it."



THERE ARE EXTRA DOLLARS IN THIS SCRAP PILE!

. . . when you install an

American METAL TURNINGS CRUSHER



Pays for itself in 3 Profitable Ways:

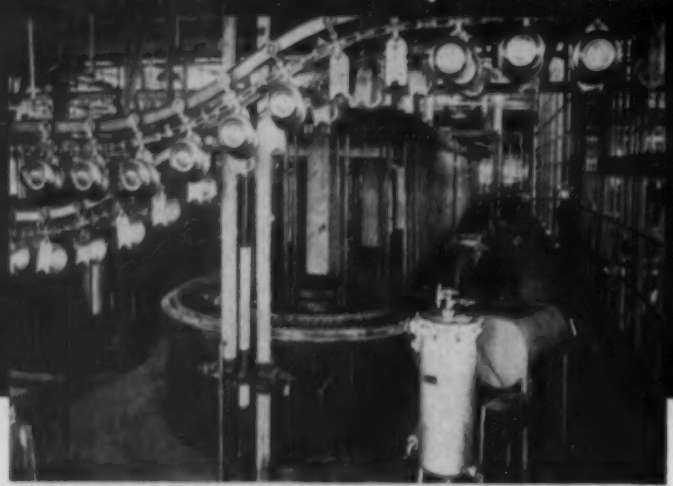
1. **TOP SCRAP VALUE.** Uniform short shoveling turnings produced by an American bring up to $4 per ton more than regular machine shop turnings.
2. **INCREASED CUTTING OIL RECOVERY.** Up to 50 gallons per ton are released from turnings reduced in an American.
3. **EASIER HANDLING, STORAGE.** American-reduced turnings require but a fraction of the usual storage space . . are easily briquetted.

Available in 1 to 10 tons per hour capacities to meet your needs. WRITE today for the complete American profit story.

American PULVERIZER COMPANY

1439 MACKLIND AVE. • ST. LOUIS 10, MO.

MEAKER
ENGINEERED
Plating Equipment



DESIGNED FOR HIGHEST EFFICIENCY in YOUR PARTICULAR OPERATION

MEAKER puts engineered efficiency into its line of plating, anodizing, phosphatizing, and other processing equipment. MEAKER engineers will help you determine what specific kind of equipment you need . . . and then see that you get it! Whether you need standard or special, fully automatic or batch type, straight-away or return style, through MEAKER'S recommendations you can be *sure* of getting the ideal installation for your particular process. Many years of experience designing and constructing plating equipment for some of the nation's top industrials has given us the technical ability that assures you the utmost in efficiency—high production plating at low unit cost.

Call or write today and have a MEAKER representative survey your problem with you at no obligation. You may be pleasantly surprised at the results.

MEAKER PRODUCTS

Write, Wire or Phone for Details on How Meaker Service Can Help You Toward Better Plating at Lower Cost.

THE MEAKER COMPANY
1631 SOUTH 55th AVENUE • CHICAGO 50, ILLINOIS
Phone OLympic 2-2110

unit purchase allotment at the Wenden, Ariz., depot has been virtually completed and the Deming, N. Mex., allotment is unlikely to be exceeded for at least a year. Higher quotas for Wenden and Butte, Mont., are being considered. No definite action has been taken on the proposal to establish another low grade ore depot in Virginia. Despite lack of market for their low grade ores, Virginia producers are the main contributors to the car lot program.

Costs Still High

One reason for the government's go-slow policy is the desire to see what comes of the various research projects seeking economic use of low grade ores and manganese-bearing slags. The U. S. has huge supplies of these but beneficiation entails excessive losses at present.

Preliminary reports indicate technical success of the Dean process for treating low grade Cuyuna ores being tested by Manganese Chemicals, Inc., in a pilot plant at Riverton, Minn., although final cost estimates are not yet available. Other test plants were completed and started in 1954 but it is still too early for evaluation of these.

Metal Powders:

New applications spur use . . . Will absorb surplus.

R. L. Ziegfeld
Secretary-Treasurer
Metal Powder Assn.

Capacity to produce most of the common metal powders now exceeds current consumption, assures users of ample supplies. At the same time constant discovery of new applications for powders indicate that in time this excess capacity will be absorbed. As an example, automotive piston rings made of iron powder have undergone ex-

tensive and successful testing and will probably become a commercial reality before long. They appear to have both cost and performance advantages.

Growing use of "contact" or iron powder coated electrodes for welding is also already making itself felt in broadening the market for iron powder. Direct production of strip and sheet from copper powder is another development that bears watching as a possible important consumer of this powder as it by-passes several production stages.

See Refractory Gains

In addition to the common metal powders much expansion may be expected in the use of a wide variety of metals in powder form. Particularly are the refractory metal powders receiving a lot of attention for high temperature applications. Titanium powder is one which bears watching as the powder metallurgy technique appears to have advantages in its fabrication.

While 1955 metal powder business will depend in large degree on the prosperity of the industries using its products, new applications and wider acceptance of metal powder parts should cause this industry to improve more rapidly than general business.

Pressure Pipe:

Expect increase in cast iron pressure pipe use in '55.

S. E. Linderan
Executive Vice-chairman
Cast Iron Pressure Pipe Institute

The 1955 outlook for the cast iron pressure pipe industry appears excellent, based on various reliable forecasts. We believe volume of both water and sewer construction should be greater percentage wise 1955 than 1954. Our 1954 tonnage should exceed 1,200,000 tons and 1955 could be up 5 to 10 pct. We expect 1955 to show increase in use of roll-on joints and mechanical joints for both water and gas service.

MOST H.P. HOURS
WISCONSIN
HEAVY DUTY
Air-Cooled ENGINES
REG. U.S. PAT. OFF.

Identify Your Equipment with this Significant Symbol of
POWER PERFORMANCE and LONG ENGINE LIFE

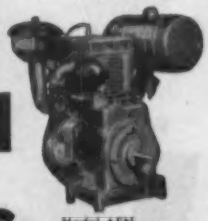
If you are a manufacturer of engine-driven equipment of any kind, you stake the reputation of your company on the PERFORMANCE of the Power Component. The saleability, acceptance and customer endorsement of the equipment itself logically hinges upon the quality of the service it delivers. When the *power* fails, the *equipment* fails.

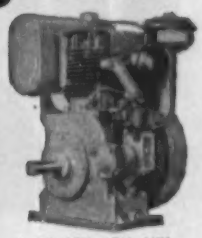
The significance of the Wisconsin Heavy-Duty Air-Cooled Engine "MOST H. P. HOURS" trade-mark is important to you because it states a fact that is vitally important to the customer-user. It represents a positive sales asset both to the equipment manufacturer, his distributors and dealers . . . *because it means what it says!* It's a symbol of dependability, low cost maintenance and long engine life.

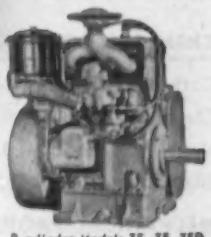
Field service records in many types of operations . . . in the construction field; in farm service; on oil field, material handling, truck refrigeration, mining and quarrying equipment . . . show that wherever rugged operating conditions are encountered, Wisconsin Engines are proving their case every day, in all climates.

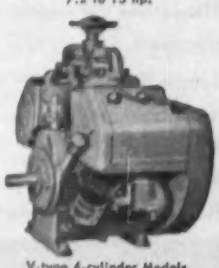
Our Engineering Department will be glad to co-operate with your design engineers in adapting Wisconsin Engines to your specific requirements. Don't overlook the potentials of this "Plus Value" as standard, specified power for *your* equipment.

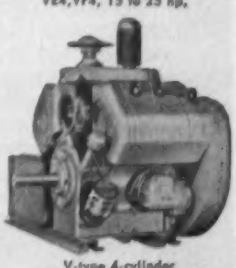
Models ABN, AKN
3 to 6 hp.


Model AEN
4.5 to 8.25 hp.


Models AFH, AGH, AHH
6 to 9.2 hp.


2-cylinder Models TE, TF, TFD
7.2 to 15 hp.


V-type 4-cylinder Models
VE4,VF4, 15 to 25 hp.


V-type 4-cylinder
Model VG4D, 25 to 36 hp.

WISCONSIN MOTOR CORPORATION
World's Largest Builders of Heavy-Duty Air-Cooled Engines
MILWAUKEE 46, WISCONSIN

with

V2B!

The only hardenable stainless alloy with superior resistance to severe corrosives

Check these properties! If galling is your problem, V2B may be your solution!

CHEMICAL COMPOSITION RANGE (cast form)

Carbon	0.07% max.	Copper	2.0—2.25%
Chromium	19.0—19.5%	Molybdenum	3.0—3.5%
Nickel	9.75—10.25%	Manganese	0.50—0.75%
Silicon	2.50—3.00%	Beryllium	0.10—0.20%

MECHANICAL PROPERTIES*

*These are the typical properties achieved in the cast form with the usual heat treatment. Special heat treatments may be used to secure higher hardness.

Tensile Strength (psi)	151,600 (psi)
Yield Strength (psi)	122,400 (psi)
Elongation %	3
Red. of Area %	2

Hardness BHN 302 As-Cast 269 Quench Annealed 363 Annealed Hardened

High hardness and strength, coupled with excellent resistance to corrosives, make V2B ideal for valve discs, plug cocks, shaft sleeves, impellers, pump casings, wearing rings, poppets, conveyor links, rollers, gear blanks and similar parts requiring galling, seizing, wear and corrosion resistance. It is now being produced in sand, shell mold and precision castings; in bar stock and in a variety of cylindrical shapes.

Technical data on request

COOPER ALLOY
CORPORATION • HILLSIDE, N. J.

Power:

Electric generating capacity at peak . . . Add more in '55.

Harold Quinton
President
Edison Electric Institute

The industry's Diamond Jubilee year, 1954, saw more new generating capacity added than ever in the country's history—11.5 million kilowatts of capability, well above the previous high of 10.1 million kilowatts in 1953. And 1954 saw the biggest output of electricity. It also produced a survey and forecast for the future which indicates that by the year 1965 demand for electric power will be double that of today, and that by 1975 it is reasonable to expect a three or even four-fold increase.

To keep up with increasing demand, the survey indicates the industry must plan to add from 7 to 12 million kw of new generating capacity each year between now and 1965. After 1965, the requirements for new capacity to take care of load growth may be from 11 to 24 million kw a year.

The survey estimated that generating plants using atomic energy as fuel will total one to two million kw of capacity within the next ten years, and that by 1975 we might have from 40 to 65 million kw of atomic power plants, of an expected total capability of 301 to 423 million kw of generating capability.

Construction expenditures by the investor-owned companies totaled $2,900,000,000 in 1954 as compared with $2,876,000,000 in 1953. The 1955 construction budget is $2.9 billion.

Construction in 1955 is expected to exceed the record-breaking level attained in 1954. Thirteen million kw of new generating capability is scheduled for the entire electric industry in 1955.

Rail Bars:

Producers expect 5 to 10 pct pickup in 1955 business.

O. W. Irwin
President
Rail Steel Bar Assn.

The future of the rail steel industry is linked with the fortunes of three industries: construction, agricultural implements, and furniture manufacturing. There seems to be no question about the continued prosperity of the construction industry, especially concrete highways for which high strength rail steel concrete reinforcing bars are particularly applicable. There probably will be a considerable increase in the demand for sections to be used in manufacturing agricultural implements. There certainly will be no decrease, but perhaps an increase, in the demand from the furniture industry. Sizing up these separate items, it seems safe to predict that 1955 will see an increase of between 5 and 10 pct on the 1954 business.

Studies are in progress to improve the weldability of rail steel sections. The resistance of rail steel reinforcing bars to near blast loads has passed the first

"We had words, all right, but I didn't have a chance to use mine."

NEW...

Scientific Advance in Head Protection

Internal as well as External head protection achieved by patented "geodetic" suspension in New Willson Super-Tough® Hats and Caps.

Realizing that most fatal head injuries are due to shock to the brain rather than injury to the skull, the Cornell Aeronautical Laboratories designed and patented a new suspension system for industrial safety hats that provides maximum protection and comfort to the wearer.

This patented suspension is available only in Willson Super-Tough® Hats and Caps!

This suspension is made up of "geodetic" crown straps scientifically located to distribute the force of a blow over the entire head—not concentrate it in a small area on the crown of the head. In addition, the tough Fiberglas hat shell is made safer and more comfortable to wear by the pneumatic cushioned head band. This pneumatic cushion absorbs and distributes the force of lateral blows through a series of metered, interconnected air cells.

Write today for the new Willson Super-Tough® hat bulletin which describes in detail the "why and how" of these new Willson Super-Tough® hats with the advanced, patented suspension.

Clip and mail coupon for latest head safety information.

Please send me your bulletin on the new Willson Super-Tough® Hats and Caps with "geodetic" crown straps and "pneumatic" head band.

*NAME*_____ *TITLE*_____

*COMPANY*_____

*ADDRESS*_____

*CITY*_____ *ZONE*_____ *STATE*_____

More Than 300 Safety Products Carry This Famous Trademark

WILLSON

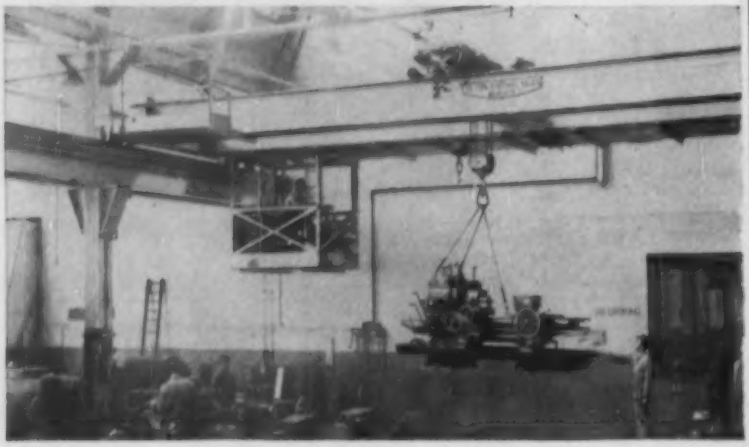
Leaders in Research and Development of Safety Equipment Since 1870

231 Washington Street • Reading, Penna.

SHEPARD NILES Crane

CLEAR the HURDLES

on your factory floor!



Why permit machines, materials and men to slow your handling down?

Move loads through the air where there's space to spare by installing a Shepard Niles Crane. Go up and over . . . rather than around . . . obstacles on your production floor.

A Shepard Niles Crane will give you years of fast, efficient load-handling with freedom from costly maintenance. That's because all component parts are designed and built by Shepard Niles expressly for crane service. Choose from light, medium and heavy-duty cranes in slow, medium and high speeds. Available for constant or intermittent duty with cab, floor or pulpit operation.

Write today for latest Crane Bulletin. Ask to have a Shepard Niles representative call. His experience qualifies him to recommend a crane that will meet your plant's needs in every detail.

America's Most Complete Line of Cranes and Hoists since 1903

CRANES
Overhead: Top Running, Inner Running Under Running, Floor or Cab Operated.

HOISTS
Operated from Cab, Floor or Pulpit.

SHEPARD NILES
CRANE AND HOIST CORPORATION

1482 SCHUYLER AVE., MONTOUR FALLS, N.Y.

test with flying colors. Accelerated exposure tests have been run on reinforced concrete beams reinforced in part with old style deformations and in part with the new high, closely spaced deformations. These tests indicate that the new deformations so control cracking as to make possible the use of high yield point reinforcing bars with greater efficiency and consequently less total cost.

The 1953 shipments of rail steel products were approximately 8 pct above the shipments of 1952. In 1954 the shipments were approximately 6 pct below those of 1953.

The rail steel section of the steel industry (with 17 member companies) has learned how to profitably live with 70 pct operation, through diversification of products and through research to improve both old and new products. The Industry expects to be equally successful in the year 1955.

Scrap:

Consumption in '55 will top '54, but won't set record.

E. C. Barringer
Executive Vice-President
Institute of Scrap Iron & Steel

No expansion is taking place in the iron and steel scrap industry — and little is probable in 1955. We will have to digest the great expansion experienced since VJ-Day. Whatever new equipment is being installed is entirely replacement for antiquated equipment.

In 1953, the consumption of purchased scrap was approximately 31.6 million gross tons. My estimate for 1954 is approximately 24 million gross tons. In view of the many forecasts that 1955 generally for industry will be better than for 1954 but not equal to 1953, a good guess for purchased

scrap consumption might be 27 to 28 million gross tons. While 1953 appears to have been an all-time high for business as a whole, the best year in point of purchased scrap consumption was 1951 at 33.8 million gross tons.

The outstanding achievement of the scrap industry in 1954 was its ability to hang on. For all practical purposes the market for purchased scrap and the price declined 50 pct in a little over a year. Few industries could have taken such punishment and survived. Next in importance was opening up exportation of scrap on an unrestricted basis on April 1, 1954, and our efforts in the closing months of the year to stand off assaults against this policy of the government.

Shipbuilding:

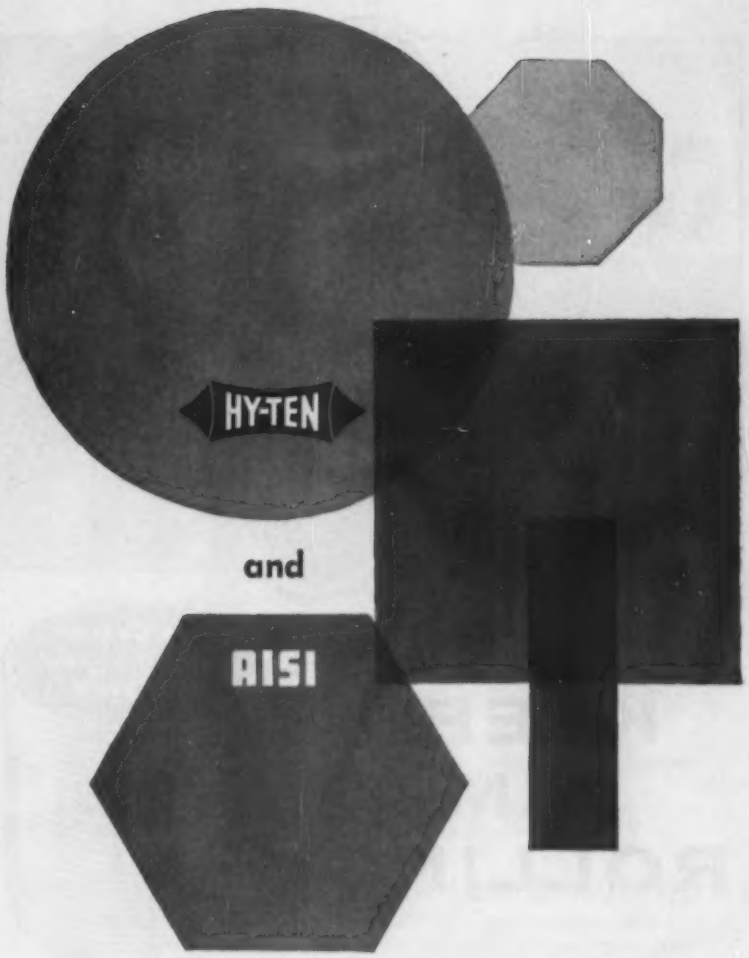
Expect employment to trend up in second half of 1955.

L. R. Sanford
President
Shipbuilders Council of America

It is apparent that work on orders now on hand and those in prospect will eventually result in reversing the present downward trend in employment to a gradual progressive increase in employment in the shipyards in the latter part of 1955.

The ship repair yards have already begun to receive contracts as a result of Public Law 608 which authorized the Secretary of

"You engineers never take a shop man's word for anything!"



bars, billets and forgings in sizes, shapes and treatments for every need!

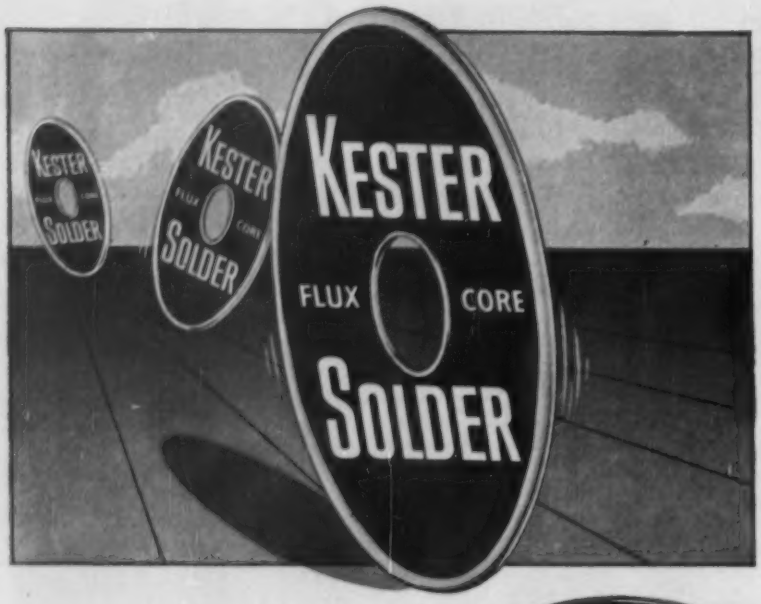
Wheelock, Lovejoy & Company, Inc., can fill your alloy steel requirements promptly. This applies to both standard AISI and SAE steels and to our own HY-TEN steels—"the standard steels of tomorrow". Take advantage of our seven strategically located warehouses. All of them can supply these steels in the form and quantity you need. Every warehouse, too, is staffed with expert metallurgists who are ready to serve you.

Write today for your FREE copies of Wheelock, Lovejoy Data Sheets. They contain complete technical information on grades, applications, physical properties, tests, heat treating, etc.

near you . . .

Warehouse Service—Cambridge • Cleveland • Chicago
Hillside, N. J. • Detroit • Buffalo • Cincinnati
In Canada—Sanderson-Newbould, Ltd., Montreal and Toronto

WHEELOCK, LOVEJOY & COMPANY, INC.
126 Sidney Street, Cambridge 39, Mass.



KEEPS 'EM ROLLING!

It's good to know you can always depend upon Kester Flux-Core Solder to keep production rolling. That's because Kester makes solder quality a never-swerving habit, insisting on constant solder alloy control and consistent flux formulae. When you want dependable solder and soldering, Kester Solder is the right name to remember!

BE SURE YOU GET Kester's 78-Page Informative Textbook "SOLDER . . . Its Fundamentals and Usage."

KESTER SOLDER

COMPANY 4215 Wrightwood Avenue, Chicago 39, Illinois
Newark 5, New Jersey • Brantford, Canada

Commerce to have repaired, modernized, or converted, over a 2-year period, some 205 vessels of the reserve fleet deemed essential for immediate use on M-day.

As of Nov. 1, 44 contracts had been awarded covering preliminary repairs on 28 vessels drawn from the National Defense Reserve Fleet. Employment in the repair yards decreased 16% from Jan. 1, 1954, to June 30, 1954, a figure obtained from a representative sample of 100 ship repair yards.

Shipbuilding and ship repairing on the Great Lakes is even more limited than last year. Only one large commercial vessel, a self-unloader, is under construction on the Lakes, with no present prospects for any more new commercial construction. Due to decreased 1954 demand for ore from the mills with consequent congestion in ore storage facilities in lower Lake ports, not all available vessels of the ore fleet were placed in service this year.

Quite the reverse conditions exist along the inland waterways. Tonnage carried on the inland waterways in 1953 broke all previous records and it is expected that 1954 figures will show that record topped by approximately 15 pct. Inland ship and boat yards as of October 1 had exceeded last year's production. However, the number of vessels under construction or on order in 1954 was considerably less than in 1953.

"The designers ran out of ideas—so you trim it to suit yourself."

Standards:

Industry has fine chance to coordinate efforts.

Vice Admiral G. F. Hussey, Jr., USN (Ret)
Managing Director
American Standards Assn.

In automation, construction, atomic power, defense and world trade, industry has a golden but brief opportunity to conduct a nationally coordinated program of standards development. In other industrial fields, this opportunity has never been fully explored. Science has pushed so far ahead of industry that a great reservoir of scientific data is waiting to be converted to industrial use.

American business enterprise has available to it a powerful set of tools for solving the problems of our fast moving economy—for controlling the development of the future to our best advantage. These tools are standards. Preplanned standards will be essential to an orderly transition, unless industry is willing to foot the bill to unscramble the mess later on.

The new industrial era demands broadened use of the standardization technique. The time is here for U. S. industry to build what it has never had and will sorely need —a comprehensive integrated set of voluntary national standards for dimension, definition, performance, testing and safety. The resultant economies and added efficiency from nationally coordinated standards are beyond calculation. The resulting chaos for lack of adequate national standards is equally staggering to contemplate.

There are encouraging signs in this direction. Government-industry standards are beginning to come into alignment through new cooperative arrangements. U. S.

AT THE FRONTIERS OF PROGRESS YOU'LL FIND . . .

NEW

Aircosil

FOR QUALITY SILVER BRAZING

For your production line or "one-a-day" silver brazing jobs, use AIRCOSIL — Airco's new and complete line of silver brazing alloys — and be sure of top-quality joints. When properly brazed, any AIRCOSIL joint will stand up under the severest tests of tensile, impact, and shear strength. Piping joints brazed with AIRCOSIL stay fluid-tight, even to pressures that burst the pipe itself. AIRCOSIL has high thermal and electrical conductivity . . . high corrosion resistance.

AIRCOSIL 45: 45% silver plus copper, zinc, cadmium. 1125° F. to 1145° F. Most popular alloy available. Lowest temperature. Very free-flowing and very high strength.

AIRCOSIL 50: 50% silver plus copper, zinc, cadmium. 1160° F. to 1175° F. Government Grade IV. Very popular. High strength.

AIRCOSIL 35: 35% silver plus copper, zinc, cadmium. 1125° F. to 1295° F. Long plastic range. Ideal for making fillets. High strength, all metals.

AIRCOSIL 3: 50% silver plus copper, zinc, cadmium, 3% nickel. 1195° F. to 1270° F. The standard alloy for brazing carbide tool tips to steel shanks.

AIRCOSIL 15: 15% silver plus copper and phosphorous. 1185° F. to 1280° F. For copper, brass, and bronze. Self-fluxing on copper.

NEW AIRCO SILVER-BRAZING FLUX!

Available in paste form, AIRCOSIL Flux liquefies and becomes active at a slightly lower melting temperature than AIRCOSIL. Will not freeze or crystallize. Residue washes off in hot water. Available in ½, 1, and 5 lb. jars . . . also 30 and 65 lb. containers.

SEND TODAY FOR 20-PAGE SILVER BRAZING BULLETIN ..IT'S FREE

Air Reduction
60 East 42nd Street
New York 17, New York

Gentlemen:
Please send me your new Silver Brazing Bulletin.

Name_____

Street_____

City_____

AIRCO®

AIR REDUCTION

60 East 42nd Street • New York 17, N. Y.

Divisions of Air Reduction Company, Inc., with offices in most principal cities

Air Reduction Sales Company
Air Reduction Pacific Company

Represented Internationally by
Airco Company International

Foreign Subsidiaries: Air Reduction Canada, Limited, Cuban Air Products Corp.

Products of the divisions of Air Reduction Company, Incorporated include: **AIRCO** — industrial gases, welding and cutting equipment, and acetylenic chemicals • **PURECO** — carbon dioxide, liquid-solid ("DRY-ICE") • **OHIO** — medical gases and hospital equipment • **NATIONAL CARBIDE** — pipeline acetylene and calcium carbide • **COLTON CHEMICAL COMPANY** — polyvinyl acetates, alcohols and other synthetic resins.

business is beginning to recognize the opportunities for protecting its export markets through international standards.

More and more companies are founding standards departments which are taking their place beside other departments whose functions are to assist executive management in planning and operation. In many instances, however, management interest in standardization activities is minute.

Created through the American Standards Association, nearly 1500 American Standards are in daily use, an increase of 600 in less than 10 years. Current projects include safety standards for children's toys, furniture and clothing, standardization of industrial pallets, handling of radioactive isotopes, industrial diamonds and their tools, performance requirements for all fabrics used in wearing apparel and household furnishings, criteria for effects of industrial noise on hearing, reproduction of documents on microfilm, methods of test and rating for components in electronic circuits, terminology of automatic controls. There are 370 others.

Yet this a poor showing against the 9300 German standards, 4000 French standards, 2500 British, and 3500 of Russia's 8000 standards on file in ASA's library.

THE "WHAT" Nearly forty steel mills, here and abroad, have purchased Differential Air Dump cars in capacities ranging from 30 to 60 cubic yards (level load).

THE "HOW" Massive air cylinders on both sides power the two-way, 50° dumping action. Wide spacing of fulcrums contributes to riding stability. No locking mechanism — no accidental dumping.

Down-folding doors chute the load a greater distance from track. Positive door return when car is righted. Overall ruggedness and simplicity of design mean minimum maintenance.

THE "WHY" It all adds up to a "higher ratio of payload to dead weight," superior performance — and ultimately to a prettier picture on the operating statement. That's "why" more and more steel mills have put Differential cars on their "earn-roll."

Other Differential Products: **Locomotives, Mine Cars, Mine Supply Cars, Rock Larries, Mantrip Cars, Rotary Dumpers and other dumping devices, and Complete Haulage Systems.**

D
DIFFERENTIAL
STEEL CAR COMPANY
FINDLAY, OHIO

SINCE 1915—PIONEERS IN HAULAGE EQUIPMENT

Steel:

Output will rise in '55 . . . And last year was one of best.

Max D. Howell
Executive Vice-President
American Iron and Steel Institute

The industry's 1954 output of about 87 million tons of ingots and steel for castings was among the eight largest in history. In 1955 the industry will move forward. Its output will be larger than in 1954, even though it may not operate at its high rated capacity, which includes a large reserve margin for defense needs.

Construction will continue to require large amounts of structural steel. The oil industry will again be a large user. New highway will need much steel. Other large consuming industries will have substantial activity. Inventories are reduced and other aspects of the business readjustment completed.

Have Spent $6 Billion

Steel companies have spent about $6 billion for modernization and expansion since the end of World War II, in addition to hundreds of millions of dollars invested in new iron ore reserves and taconite plants. They will spend heavily in 1955.

The industry's rapid technical progress in recent years served it well during 1954 when sales volume declined while fixed costs re-

mained high. Greater efficiency was achieved with improved processes, larger furnaces, better raw materials, improved rolling mill equipment, better production planning, increased standardization of mill procedures and other changes.

Raw materials activities included the further development of taconite and other low grade ores, continued improvement in the beneficiation of iron ore and coal, and the receipt of first ore from new mines in Venezuela and Quebec-Labrador.

Steel companies are studying atomic energy more closely. The use of electronic controls has been broadened. Progress has been made in the use of rare earth elements in stainless steel production. Vacuum melting is being used for the making of specialty steels. Progress is being made in the extrusion of steel, in the use of pure iron in research work, and in many other directions. Some of the companies in the industry are enlarging their research facilities and building new laboratories.

Steel Windows:

Production running about 75 pct of expanded capacity.

George Hingston
Executive Secretary
Steel Window Institute

From the conclusion of World War II through 1950, the steel window industry expanded facilities to keep up with the demand, perhaps a 35 pct increase. This

"She may not be managerial timber, but she sprouts some nice limbs."

Stainless Steel Plates ready for fabrication accurately produced by

G. O. CARLSON, INC.

FABRICATORS time and time again turn to G. O. Carlson, Inc. for what they need in stainless steel. These fabricators know that Carlson's experienced specialists in Engineering and Production plan their work . . . for accuracy, for economy, for prompt delivery.

The patterns illustrated are typical. Made from Type 304 stainless, these blanks are sheared and sawed from ⅜" plate to 16½" x 23½" dimensions. One 8⅛" diameter hole and twenty 2½" diameter holes were machined in these patterns to give the fabricator pieces requiring only a minimum of additional work before actual fabrication.

It is this "done right" aspect of Carlson workmanship that has built a service on which customers fully depend. For your work in stainless, let Carlson do it—and be completely satisfied. We'll gladly answer your inquiry without delay.

Stainless Steels Exclusively

G. O. CARLSON, INC.

Plates • Plate Products • Forgings • Bars • Sheets (No. 1 Finish)

THORNDALE, PENNSYLVANIA

District Sales Offices in Principal Cities

capacity has not been taxed in the succeeding years, present production being about 75 pct of capacity.

Construction Looks Good

We can make only some secondary predictions because the steel window industry is entirely dependent on the construction industry, particularly industrial construction. All indications point to a good construction year for 1955. The steel window industry will benefit if this prediction is realized.

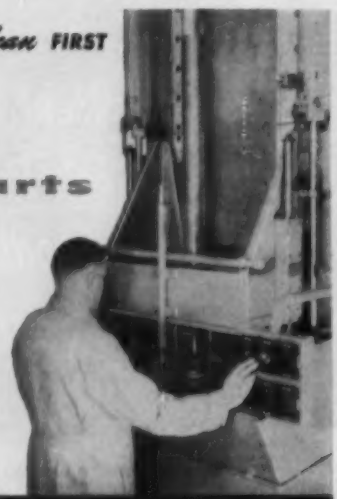
Nonferrous Helps

Dollar volume is about the same for steel windows. However, if the nonferrous window volume produced by the steel window manufacturers is added, the indicated increase would approximate 25 pct.

This increase is chiefly due to residential and housing construction.

ANOTHER *American* FIRST

28 different diesel truck parts BROACHED on ONE MACHINE



*Machine utilizes three types of broaches — round, plain spline and combination round-and-spline.

*Interchangeable thrust bushings which adapt to a universal equalizing fixture.

*One to three station broaching depending on size and shape of part to be broached.

Here's an example of the flexibility of tooling American can build into a broaching machine to fill special requirements. Shown at left are some of the 28 different diesel truck parts a manufacturer is producing with the aid of an American vertical pull-up broaching machine. Note the variety in types of parts — broach lengths varied from 33 to 70 inches.

An added feature of this machine is a lower elevator follow-up during the first part of the broaching stroke providing greater back support and eliminating vibration.

Whether you need extreme versatility — with many parts broached by one machine, as in this example — or the high volume, low cost production resulting from completely automated broaching of single parts, American is prepared to serve you. American engineers and builds all three — broaching machines, broaches and broaching fixtures.

Let us work on your broaching problem.

Write for catalog 450 — the new and informative manual on American broaches, machines and fixtures.

American BROACH & MACHINE CO.
A DIVISION OF SUNDSTRAND MACHINE TOOL CO.
ANN ARBOR, MICHIGAN

See *American* First — for the Best in Broaching Tools, Broaching Machines, Special Machinery

Structural:

Fabricators see '55 as good if not better than '54.

E. V. Grover
President
American Institute of Steel Construction

Business in the fabricated structural steel industry should be as good, if not better, in 1955 as it was in 1954, according to our statistics.

Preliminary reports of the Institute show that though the boom has eased, business has continued at a steady pace during the first 11 months of 1954. Shipments of fabricated structural steel this year will be the highest since the 1929 peak, but bookings of new orders will be somewhat less than in 1953.

Shipments for 1954 will amount to approximately 3,200,000 tons as compared with 3,117,711 tons in 1953, an increase of nearly 3 pct, and bookings will total 2,500,000 tons against 2,786,590 tons in 1953, a decrease of a little more than 10 pct.

Nearly $40 Billion Due

Projects proposed throughout the country indicate an over-all construction program amounting to $39.5 billion during 1955 as compared with $37 billion in 1954.

Highway construction has $5 billion ear-marked in Federal funds. In addition, tabulations covering only 18 states show contemplated expenditures of more than $4.5 billion for toll roads alone. Such super-highways will require thousands of overpasses, underpasses and bridges, as evidenced by the 282 crossings, all of steel, on the 160-mile Garden State Parkway in New Jersey and the 507 on the 427-mile New York to Buffalo Thruway.

Mr. Grover is president, Apex Steel Corp., Ltd.

Construction of schools and colleges is expected to also receive a large part of construction funds. This construction is estimated to require $6.7 billion over a 10-year period with approximately $2.5 billion to go into current needs. Here again the trend toward the use of steel in the design of educational structures is expected to increase the demand for structural steel.

Tin:

Soft drinks, other new uses give promising outlook.

R. J. Nekervis
Chief Metallurgical Engineer
Tin Research Institute

With stockpile goals reached some time ago, 1954 tin consumption of less than three-quarters of production appears, at first glance, to be critical. In actual fact, the long-term outlook is encouraging. For one thing, the International Tin Agreement is almost certain to have a steadying effect on prices. And the rising standard of living in many countries also makes the outlook for tin on a world-wide scale a good one.

New developments which are fairly well along commercially are beginning to alleviate the downward trend in tin usage in the U. S. Estimates are that 1954 canned soft drink production was 1 billion; eight times what it was a year ago. Five soft drink canneries were in operation at the first of last year. Now there are 60 or 70. Compared with the production of 28 billion bottles of soft drinks in 1953, this is only a start. But canned beer, introduced in the late thirties, now accounts for one-third of all package sales of the brew. Of the 35 billion cans made in 1953, nearly one in every six was a beer can. Soft drink cans are a tougher pack from a corrosion standpoint and have so far required several times more tin than a beer can.

"I'm retiring next week, and I wonder if you gentlemen could give me any pointers on how to waste time?"

New Auto Use Gains

Another important new use is heavy gage electrolytic tinplate for automotive parts. It is an excellent paint base. Other promising developments are in the tin alloy electroplating field. Tin-zinc plating combines the solderability

Why take this Terrible Risk?

Many effective industrial cleaning compounds are flammable. Some of Industry's most disastrous fires (including the greatest) have been caused by the use of these explosive cleaners.

Other types of cleaning compounds are toxic, irritating to skin or lungs—noxious and unpleasant, as well as dangerous.

One Cleaner that has achieved nation-wide use in one short year is KELITE SPRAY WHITE. It is non-flammable . . . non-toxic . . . practically odorless. Nearly all of America's largest manufacturers now use it. (A list of several hundred will be sent on request.)

KELITE SPRAY WHITE is patented* . . . unduplicated. KELITE SPRAY WHITE is safe to use on nearly all surfaces. KELITE SPRAY WHITE easily and safely removes all common soils from all types of equipment—anything from a battleship engine to a white rubber tire. SPRAY WHITE is used in the simplest possible way . . . "Spray it on—wipe it off."

Test SPRAY WHITE on your own equipment. Your local Kelite Service Engineer will be happy to demonstrate SPRAY WHITE without cost or obligation. **Write or phone today**—no matter what your cleaning problem. Phone CApital 2-0201 or your local Kelite office...or write Kelite, 1250 N. Main, Los Angeles 12, Calif., U.S.A.

*U. S. Patent No. 2381124

KELITE

Service Offices in 98 Principal American Cities and 16 Countries Abroad
Manufacturing Plants in
Los Angeles • Berkeley Heights, N. J. • Chicago • Dallas • Mexico City

ARMSTRONG
Carbide
TOOL HOLDERS

For Higher Speeds, and Heavier Feeds

ARMSTRONG Carbide Tool Holders and ARMIDE (Carbide Tipped) Cutters come in cased sets for tool rooms and maintenance departments, and individually in all sizes for general machine shop and production turning. They permit not only the ready machining of sand-filled castings, the hardest and toughest steels as well as many heretofore "unmachinable" materials, but also make practical much heavier cuts and cutting speeds up to 600 f.p.m. on ordinary work. They also run from 10 to 100 times as long between regrindings.

Write for Catalog

ARMSTRONG BROS. TOOL CO.
"The Tool Holder People"
5209 WEST ARMSTRONG AVE., CHICAGO 30, ILLINOIS
NEW YORK • SAN FRANCISCO

of tin with the sacrificial protection of zinc, useful in electronics. Tin-nickel and tin-bronze are also promising for corrosion protection.

Though not in commercial production, aluminum-tin bearings (20 to 30 pct tin) and phonograph records of aluminum, brass or steel clad with tin are promising.

TOOLS:

Machine tool industry banks replacement sales for '55.

Milburn A. Hollengreen
President
National Machine Tool Builders Assn.

Throughout 1954 machine tool shipments held reasonably steady at a rate somewhat above previous peace-time experience, but substantially below the industry's post-Korea capacity. Shipments for 1954 are estimated at approximately $900,000,000, by comparison to 1,191,200,000 for 1953.

Orders for national defense accounted for a minor share of the industry's 1954 business. Despite discussions for activating, under the Vance plan, government orders for long lead-time and very large "elephant" machines required for preparedness against a possible future emergency, no such orders actually materialized in 1954. Meanwhile nationalistic restrictions and regulations, tariffs, dollar shortages and low wage rates, in other countries, combined to hold machine tool exports to a minimum.

The industry's level of sales in 1954 was in the main the measure of its success in persuading metalworking industries within the United States to replace old, obsolete, high-cost machine tools with new, low-cost, efficient models.

Mr. Hollengreen is president and general manager, Landis Tool Co.

Looking toward 1955, the picture remains much the same. The cumulative obsolescence in the country's metalworking plants is alarming. To what extent will it be recognized and corrected by modernization programs? How much replacement buying will our industry be able to stimulate by our Machine Tool Show, to be held in Chicago next September? Upon the answer to those questions depends the outlook for the Machine Tool Industry in 1955.

Truck-Trailers:

Manufacturers bullish on prospects for 1955.

John C. Bennett
President
Truck-Trailer Manufacturers Assn.

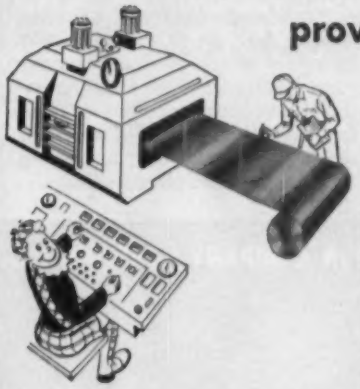
American truck-trailer manufacturers are bullish on industry prospects for 1955. Unanimous opinion among members of the Truck-Trailer Manufacturers Assn., who make more than 90 pct of all the product, is based on two observations. The first is its successful transition from a wartime to peacetime operation in 1954. Trailer manufacturers fared better in 1954 than they had expected. In 1954 the industry produced some 53,000 units. Included in this

"Let's ask Fred. He has a pipeline direct to the front office."

MicroRold® Stainless Steel

"Thinness Control"

provides strip *Quality* in SHEET *Sizes*



Remarkable uniformity of gauge in MicroRold Stainless Sheets up to 36" wide.

The "Thinness Control" used in the manufacture of light gauge MicroRold Stainless Sheets assures you of the *same* dimensional accuracy as in strip stainless. Specified gauge thicknesses may be rolled in sheet sizes with tolerances as low as 3% average (plus or minus) as compared to the A.I.S.I. allowable of plus or minus 10%. This results not only in weight savings but also in fabricating economies.

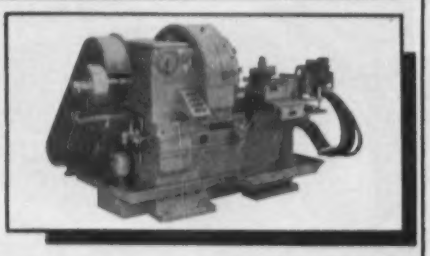
Regular use of MicroRold Sheet can give you more stainless area per ton or the equivalent area with lesser weight.

MicroRold Stainless Steel Sheets are available up to 36" wide and in gauges from .005 in commercial grades, finishes and temper.

Ask your steel warehouse distributor for MicroRold with "Thinness Control"

Washington Steel *Corporation*
Washington, Pennsylvania

Solve YOUR PUMP PROBLEM with a RUTHMAN GUSHER coolant pump



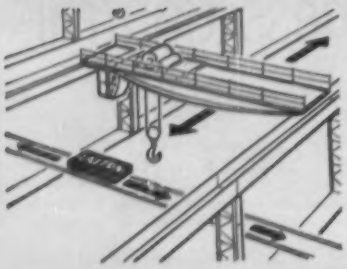
Illustrated is a LeBlond Automatic Contour Facing Lathe equipped with a Ruthman Gusher Coolant Pump.

Choose a Gusher Coolant Pump for performance, economy, long life. Built of the finest materials, Gusher Pumps give split-second coolant flow, as much or as little as you want. Your Gusher needs no priming or packing, uses less power when throttled. Precision workmanship assures long trouble-free life. Specify Gusher Pumps to solve your coolant pump problems.

THE RUTHMAN MACHINERY CO.
1809-1823 READING ROAD CINCINNATI 2, OHIO

Cross-Bay Transfer

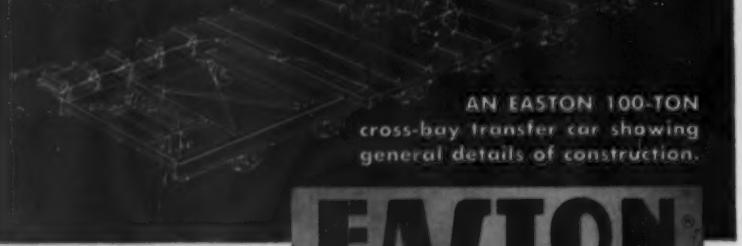
TRADE MARK



The EASTON motorized cross-bay transfer car is designed to provide lateral handling of materials to supplement overhead crane service in modern multiple bay plants. The cross-bay movement of the automatic transfer car provides a universal handling system able to spot a load anywhere on the floor of the plant. The same car system may also be used for moving materials between plant buildings.

EASTON CAR & CONSTRUCTION COMPANY · EASTON, PA.

Sales Offices in New York
Philadelphia
Pittsburgh

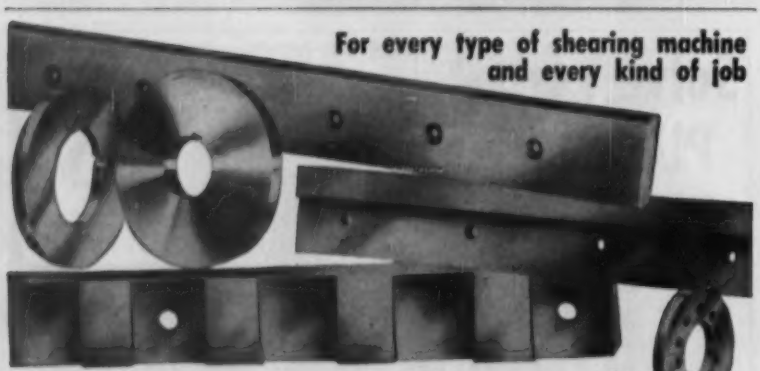


AN EASTON 100-TON cross-bay transfer car showing general details of construction.

EASTON

A-1046

For every type of shearing machine and every kind of job



"multicut"

SHEAR BLADES and ROTARY KNIVES

℞ Engineered to the job . . . Every Wapakoneta blade is made to exact specifications, designed for the particular job. Complete records with order number of each blade makes possible duplication of exact size and temper at any time.

"MULTICUT", "TUFCUT", "HOT WORK"

THE WAPAKONETA MACHINE CO.
WAPAKONETA, OHIO.

Knives Engineered for the Job Since 1891

total were only 10,000 trailers for military, other government, and export, as contrasted with 46,000 trailers for this purpose the previous year.

Although production and shipments for 1954 were off 45 pct from 1953, dollar volume dropped only 19 pct. This is accounted for by the fact that the industry completed military and other government contracts, including one very large contract for a small, two-wheel type trailer with a relatively low unit-cost.

A late 1954 development was the completion of a dimension study by a joint motor truck — truck-trailer committee. This study paved the way for the manufacture of both truck-tractors and truck-trailers that will be completely interchangeable, and that will also afford the maximum loading space within the legal length limit of 45 ft. This limit is now in effect in 19 states. To be fully interchangeable from coast-to-coast, vehicles must conform to this minimum legal length limitation.

This joint committee's recommendation is particularly eventful since it is the first time the two industries supplying the motor carriers have combined their efforts to produce fully coordinated tractor-trailer combination vehicles.

"In my day, kids didn't hang around shops bothering workmen. We hung around poolrooms."

Trucks:

Body and equipment makers see continuing business growth.

Paul R. Hafer
President
Truck Body & Equipment Assn.

A survey of industry members, both Manufacturers and their Sales Distributor members, discloses that 1954, in general, was as good as, or up to 25 pct better than, 1953. New plant facilities were provided with about 5 pct increase in floor space and about 17.5 pct increase in manpower. As an indication of the changing climate in marketing conditions, sales outlets and sales personnel showed a 27 pct increase. Most surveyed firms were optimistic for 1955 with at least one and two months backlog of orders on hand to start the year. Outstanding among 1954 developments was application of the telescopic hoist to the entire range of dump body and hoist capacity units. The school bus body market has improved with the ever increasing number of school jointures and consolidations as well as the influence of the anti-segregation laws.

Urban Swing Pays Off

The Delivery Truck Body Industry has an optimistic eye on '55. With the ever increasing expansion of rural and urban living, more and more products are being distributed in Special Delivery Truck Bodies in Conventional and Drop Frame Type Trucks and the ever increasing Forward Control Type with their double payload capacities. Also, the many new food processes requiring refrigerated transportation will increase in 1955. Outstanding among custom bodies was the creation and production of traveling sales exhibits.

Mr. Hafer is President, Boyertown Auto Body Works, Inc.

FLUID DRIVE
Another First for
KRANE KAR
A SILENT HOIST
EXCLUSIVE!
Ask about the New
Lease-a-KRANE KAR-Plan
. . . 1 to 3 Year Lease with Option to Purchase.
Silent Hoist gave you KRANE KAR, the first modern Mobile Crane . . . Front-Wheel Drive . . . Stability without Stabilizers . . . Lifetime Front Axle . . . Automatic Safety Controls. And now Silent Hoist gives you FLUID DRIVE!
Increases engine clutch life.
Provides cushioned starting and acceleration.
Eliminates overload shock damage to drive gears.
Speeds operation.
Cuts maintenance drastically.
Ask for Bulletin No. 79C
"Silent Hoist" KRANE KAR Swing-Boom Mobile Crane . . . 1½, 2½, 5, 10, 12½ Ton Capacities
SILENT HOIST & CRANE CO.
Pioneer Mfrs. of Heavy Duty Materials-Handling Equipment
851 63rd Street, Brooklyn 20, N. Y.

TORIT
DUST COLLECTORS

Really draw!

A size and model to solve any dust collecting problem, Torit collectors provide complete, all-around dust control. Torit collectors are unitized for custom installation on each machine, giving power and suction only when machine is operating. Keeps plant and machines free from clogging and unsightly dust. Furthermore, cleaned and filtered air is exhausted back *into* the room maintaining heat balance. Find out now how Torit unitized dust control is engineered to your problems.

See our catalog in Sweet's Machine Tool File, or write:

TORIT
MANUFACTURING CO.
277 Walnut Street • St. Paul 2, Minn.

WHAT'S AHEAD

Welding:

Continues trend of outpacing general business activity.

J. H. Humberstone
President
American Welding Society

Demand for welding as a major production and maintenance tool has been steadily on the increase, when a new metal comes along like titanium or zirconium, one of the first questions asked is "How do you weld it?" Along with the widespread recognition of welding as a process offering unique advantages to industry, there has come a phenomenal increase in the consumption of welding products — a consumption that has been expanding much faster than business activity. This progress reflects the accomplishment of research which has enabled industry to put new welding techniques to work on the assembly lines of the nation. The net result is a higher usage rate for welding products per unit of factory output.

On the basis of the trends established by current performance, 1954 will end up as one of the three or four best years to date in the history of the welding industry and 1955 should undoubtedly witness a repetition of this high level of welding activity.

As for business in general, an expected decline in expenditures for new plant and equipment should be offset by new construction generally and a reversal of inventory liquidation. We look forward to a "recovery" in 1955 which will bring the American economy close to the record year of 1953.

Finally, development of techniques to handle highly desirable materials in volume will continue to broaden the market.

Mr. Humberston is president, Air Reduction Sales Co.

STAMPINGS
for the FINISHED
PRODUCT

SEE SESSIONS . . . for Metal Specialties, Box & Case Hardware, Stamped Assemblies in a wide range of finishes.

J. H. SESSIONS & SON

290 RIVERSIDE AVENUE • BRISTOL, CONN.

QUANTITY
PRODUCTION
OF
GREY IRON
CASTINGS

ONE OF THE
NATION'S LARGEST
AND MOST MODERN
PRODUCTION
FOUNDRIES

ESTABLISHED 1866
THE WHELAND
COMPANY
CHATTANOOGA 2, TENN.

Precision Engineering takes place on

CHALLENGE® Precision Equipment

For LAYOUT, INSPECTION, CHECKING, LAPPING, ASSEMBLY AND WELDING

CHALLENGE Semi-Steel LAYOUT SURFACE PLATES

High compressive strength · · · *Low* coefficient of expansion. 16 standard sizes, 6" thick - other sizes to order. Also available for sectional assembly into unlimited sizes. Precision ground or planer finished.

CHALLENGE WORK BENCHES

Four sizes. Cast iron top, 2-in. thick. Welded steel supports, tool box shelf, steel drawer with pilfer-proof lock.

Other Challenge products include Clamp Edge Layout Plates · · · Reading Tables · · · Lapping Plates · · · Welding Tables · · · Surface Plates · · · Bench Plates and Surface Plate Equipment. The entire line is pictured and described in Challenge's latest catalog. Send for free copy, today!

Challenge

TRADE-MARK ® 769

THE CHALLENGE MACHINERY CO.

Offices, Factories and Show Rooms: Grand Haven, Mich.

Zinc:

Basic properties, new techniques promise more sales.

E. V. Gent
Executive Vice-President
American Zinc Institute

The basic chemical and physical properties of zinc are such that it is not only holding its own but making good progress toward higher goals in the battle for markets. For example, production of galvanized sheets has recently been going through a revolutionary process—continuous galvanizing. Thirty of these new lines are now in operation or planned. In the last few weeks four additional lines were projected in the U. S. and Canada.

Over 400,000 Tons Seen

Zinc consumption for galvanizing in 1954 is likely to exceed 400,000 tons, equalling or surpassing the 1953 figure of 407,000 tons when all figures are in. Zinc die castings are the second largest outlet for slab zinc; 1954 consumption of zinc for these alloys probably totalled 260,000 to 275,000 tons. This figure contrasted with 307,000 tons in 1953 fails to tell the whole story. The 1955 automobiles have turned to zinc die castings in a big way and in other divisions of use there are also definite signs that expansion of the present market for zinc die castings is gaining momentum. The brass mills, which in 1953 consumed 178,000 tons of zinc, will not equal this figure in 1954.

Zinc for cathodic protection, although not a new use, is one which has widened its potential.

There are ample supplies available both now and for the foreseeable future. Production of primary and secondary slab zinc at U. S. smelters in 1954 was 850,000 to 860,000 tons with imports adding some 140,000 to 150,000 tons to the supply.

THIS PLA-TANK® HOOD SAVED ITS COST IN A YEAR

The PLA-TANK Hood shown above has been in continuous use at General Electric's small aircraft engine department in West Lynn, Mass., for over a year. Reports indicate that it is still as good as when originally installed, is already credited with saving its entire cost since no previously used material had lasted over a year.

The tank is used for etching stainless steel billets; solutions used are aqua regia at room temperature and a 50% solution of muriatic acid at 180°F. PLA-TANK has successfully withstood these fumes, where other materials failed.

PLA-TANK products are daily solving problems of all types in the chemical and electroplating fields. They replace or outlast stainless steel, lead and ceramic linings, plywood coated with corrosion preventatives, phenolic plastics and asbestos cement board structures in many applications.

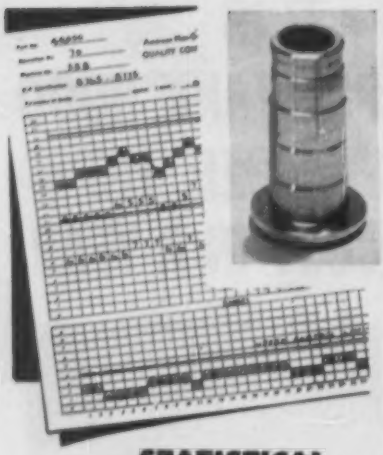
PLA-TANK, molded from long-life, resin-bonded glass fibre laminate, is now resistant to a wider variety of fumes and temperatures than ever before. PLA-TANK is light weight, easy to install, competitively priced.

Let us help you solve your problems the modern way — with PLA-TANK. Write today for free data sheets.

P-21

THE Chemical CORPORATION

77 Waltham Ave., Springfield 9, Mass.



STATISTICAL QUALITY CONTROL

... can be yours at NON-GRAN

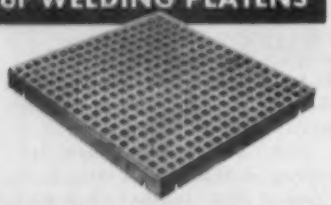
To ensure uniform high quality and closer tolerances, American Non-Gran uses statistical quality control methods in its contract machine work. Learn what this can mean to your product. Write!

NON-GRAN

AMERICAN NON-GRAN BRONZE CO. Berwyn, Pa.

Write for book "Our Story in Pictures"

BENDING BLOCKS or WELDING PLATENS



5 ft. by 5 ft. by 5½ in. cast steel blocks for layout, welding and assembly. Write today for information. Other sizes. Tools, stands & accessories.

ACORN IRON & SUPPLY CO.

Delaware Ave. & Poplar St. Philadelphia 23, Pa.

LEWIS

TRAVEL-CUT

trademark

automatic, high-speed heavy-duty

WIRE STRAIGHTENING

and

CUTTING MACHINES

Sizes for .012" to ¾" WIRE ROUNDS & SHAPES

THE LEWIS MACHINE CO.

3460 E. 76 ST., CLEVELAND, O.

WHAT'S AHEAD

Wire Fabric:

Building boom keeps welded wire fabric sales high.

W. H. Lee
President
Wire Reinforcement Institute

Welded wire fabric, the steel reinforcing material that forms the backbone of much of today's construction, looks forward in 1955 to another year of vigorous activity and increasing acceptance. Reviewing the year just ending, it is apparent that the construction industry itself is the best indicator of tonnages shipped, with these three major fields — highways, residential and commercial structures, and reinforced concrete pipe — accounting for most of our output. Since many forecasters and business experts predict another good year for construction, we feel that our product, too, will continue in good demand.

As construction calls for more fabric and as increased acceptance of this versatile, labor-saving reinforcing product steps up normal consumption, the members of the Wire Reinforcement Institute, manufacturers and producers of over 95 pct of the welded wire fabric used in the country, will be well prepared to supply the market.

"That must have been a pretty good suggestion young Jones made."

METAL STAMPING FACILITIES

by *Lansing*

at your Service for...

TRANSPORTATION EQUIPMENT

HOUSEHOLD APPLIANCES

ELECTRICAL EQUIPMENT

INDUSTRIAL EQUIPMENT

FARM IMPLEMENTS

Lansing Stamping Co.

ESTABLISHED 1914

LANSING 2 MICHIGAN

Like to speed up your reading?

Turn to pages 2 and 3 of The Iron Age every week and let the

Digest of the Week in Metalworking

help you find your favorite features.

IT PAYS TO READ IRON AGE ADS TOO!

NOW-Make Your Own Oxygen and Nitrogen in One Generator

...and Save Up to 50%!

With INDEPENDENT'S newly-designed generators, you can make your own high-purity oxygen and nitrogen from the free air . . . and in the same generator.

You reduce costs up to 50% by eliminating handling costs . . . vaporizing costs . . . evaporation losses . . . residual losses . . . and transportation costs.

INDEPENDENT Generators are available in any capacity, any purity and any pressure. Put your oxygen-nitrogen problem up to us . . . our engineering department will gladly submit recommendations . . . no obligation, of course!

INDEPENDENT ENG. CO., Inc.

CONSULTING · RESEARCH · DESIGNING

O'FALLON 4, ILLINOIS

WHAT'S AHEAD

Wire:

Expect much better year in '55; past year was spotty.

R. E. Brown
Executive Secretary
The Wire Assn.

There has been some expansion of production facilities in 1954—a trend that will continue in 1955, taking the form principally of installation of better, faster and larger capacity equipment, as, for instance, replacement of old rod mills with new units that take larger billets and that roll rods into 800-lb coils. Rods are now pickled in 3000-lb coils, instead of the old 300-lb coils, for many years considered standard. Better material handling equipment is designed to handle and anneal wire in larger coils—all to the end of reducing handling costs.

Was 3 pct of Steel

The industry now uses about 3 pct of the steel produced. As ingot production is increased, this ratio is likely to be maintained as a result of increasing demand. Projects such as road building, commercial and industrial plant construction, utility expansion, higher auto production, home construction, etc., now scheduled for 1955, should absorb much more wire than was consumed this year.

The past year was about 10 pct better than 1953. While rod production is running at around 50 pct of capacity, wire product manufacturing facilities are operating in the neighborhood of 75 pct or better. Considerable quantities of wire and wire rod are being imported for re-drawing, which accounts partially for the disparity between wire rod and wire product producing activity.

Machinery for the manufacture of rods, wire and wire products is constantly being improved, with few radical innovations. Possibly the trend of greatest interest to steel wire men is the appearance of new machines that have been developed for the continuous dry descaling of rods by mechanical means.

For Stampings

...look for the PLUS **beyond** the PRICE!

Ever think what it costs when the stampings you ordered keep falling below your specified AQL?

Steady unvarying conformance with AQL requirements, with minimum rejects – established over an excellent 39-year record – is just one of many plusses you get when you buy Detroit Stampings.

Look for the Plusses *beyond* the price the next time you buy stampings!

And be sure to try DETROIT

DETROIT STAMPING COMPANY

DE-STA-CO

345 Midland Ave. Detroit 3, Mich.

"America's Best-Known Jobbing Stampings Manufacturer"

Phil Virtue, president, Virtue Bros. Mfg. Co., Los Angeles, Calif., says:

"Wyandotte PRE-FOS and F.S. definitely clean metal better... at lower cost!"

① At Virtue Bros. Mfg. Co., this tremendous automatic plating machine (the largest on the West Coast) runs steel furniture parts through a complete cleaning and plating cycle. Wyandotte F.S., outstanding steel electrocleaner, is used in the two cleaning tanks. F.S. provides: exceptional detergency, fast and complete wetting action, controlled foaming, very free rinsing, high soil suspension, and long solution life.

② Besides F.S., Virtue Bros. use Wyandotte PRE-FOS in a spray washer, to clean and phosphatize steel parts perfectly for painting. H. W. Rueckert (center), Virtue Bros.' plant engineer, and C. Stinnett (right), paint department foreman, examine a painted part with Ken Clayton, Wyandotte representative. PRE-FOS works wonders in hard or soft water, in a spray washer or soak tank.

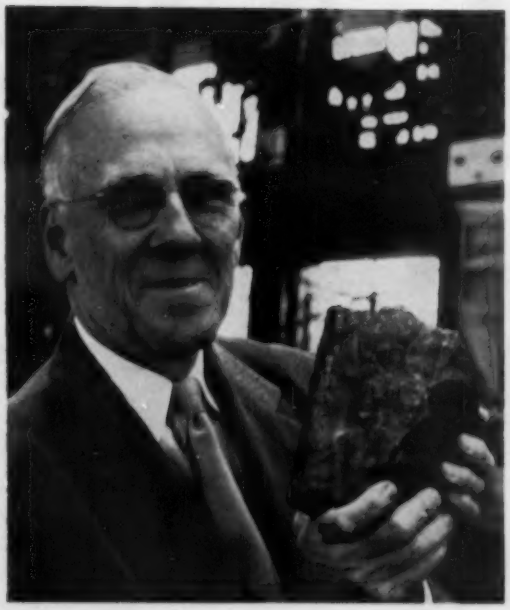
Virtue Bros. Mfg. Co. is the West's largest manufacturer of chrome and black metal dining furniture. Like many makers of metal products, this company prefers Wyandotte F.S.* for metal cleaning prior to plating, and PRE-FOS* for metal cleaning and phosphatizing prior to painting, because *Wyandotte products provide excellent cleaning at lowest use-cost.* Virtue Bros. is well pleased, also, with the services of Wyandotte's skilled technical staff.

Wyandotte offers a performance-proved line of metal cleaners, phosphatizers, paint strippers, and related products. If you have a metal-cleaning problem — or would like to see how Wyandotte products can improve your operation and, at the same time, cut costs — call your Wyandotte representative or jobber today! *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Also Los Nietos, California.*

*REG. U.S. PAT. OFF.

Wyandotte CHEMICALS

Helpful service representatives in 138 cities in the U.S. and Canada



The Iron Age SALUTES

E. W. Davis

Vision, vast technical knowledge and the perseverance to pursue a basic concept through 18 years of experimentation led him to make one of the most important developments in metalworking history.

In the Mesabi country they call Prof. E. W. Davis "Mr. Taconite," although there's probably no one who genuinely wants the title less.

Most men would be in their glory at all the publicity when a pet, 18-year project bursts into a potential billion dollar industry. Prof. Davis' major complaint is that nobody talks about his staff of 30 at the University of Minnesota who labored years to develop equipment and processes that make exploitation of the extra-low grade ore economically feasible.

This mild-appearing, gray-haired professor was wracking his brains 36 years ago trying to make a go of taconite mining and processing. As a University of Minnesota faculty member, he developed the technical know-how and patented much of it for the school. Today nearly 100 mining companies and equipment makers have retained him as mining consultant.

He got into the business back in 1912, when as a new mathematics instructor at Minnesota with a fresh electrical engineering diploma from Purdue, he began experimenting with taconite. Three years later he perfected a magnetic separator for that type of material.

Prof. Davis' major academic interest centers on what's under the ground. But he gets his biggest kick out of living and growing things on top of it. Half of the kitchen in his comfortable Minneapolis home is devoted to an elaborate greenhouse with vapor watering system, fluorescent lights and temperature control, which he built himself.

An avid follower of Minnesota's Gophers, the Professor rarely misses a football game. But his pride and joy is a cabin in Canada, 35 mi. from the nearest habitation. Mrs. Davis accompanies him eagerly to their wilderness home, which is crammed with books, paintings and photographs. Paddling a canoe 20 mi. across the lake to reach the cottage is all in the day's fun for "Mr. Taconite."

Get Extra Sub-hearth

SAFETY AND LONGER LIFE

with Permanente Periclase D-S Brick

THIS superior brick has been *especially designed* to withstand sub-hearth conditions. Thus, it gives maximum protection against costly breakthroughs and provides longer sub-hearth life.

All the important properties outlined by major steel company ceramists as most desirable for sub-hearth brick are found in Permanente Periclase D-S Brick.

High MgO (more than 95%) is achieved through the use of pre-shrunk, accurately-sized Periclase grains derived from sea-water magnesia. Absence of chrome eliminates the reduction of chromium oxide and damage to the refractory structure.

Low iron content minimizes refractory damage from alternate oxidation and reduction of iron oxide and other iron compounds. Absence of calcium oxide prevents damage caused by slaking during slow heat-ups or while furnace is idle.

With all its many advantages, Permanente Periclase D-S Brick gives you the ultimate in sub-hearth safety and durability—*yet costs no more!*

Call or write Kaiser Chemicals Division, *Kaiser Aluminum & Chemical Sales, Inc. Regional Sales Offices: 1924 Broadway,* OAKLAND *12, California . . . First National Tower,* AKRON *8, Ohio . . . 518 Calumet Bldg., 5231 Hohman Avenue, Hammond, Indiana* (CHICAGO).

Kaiser Chemicals

Pioneers in Modern Basic Refractories

Basic Refractory Brick • Ramming Materials • Castables & Mortars • Magnesite • Periclase • Deadburned Dolomite

Permanente PERICLASE Brick for the Steel Industry:

- **Permanente Periclase Brick (D-S)**
- **Permanente Periclase Chrome Brick (PCA)**
- **Permanente Chrome Periclase Brick (CPA)**

Now available! A companion mortar for Permanente D-S brick. High purity periclase composition *and* maximum workability.

Installation advice on request

The Iron Age INTRODUCES

Walther H. Feldmann, becomes executive vice-president, **Worthington Corp.** He succeeds **Edwin J. Schwanhausser** who was elected president recently. **Thomas J. Kehane,** becomes vice-president in charge of sales. **Charles A. Butcher,** named vice-president—Planning.

Lawrence Wilkinson, elected group vice-president, **Continental Can Co.,** New York; and **Charles B. Stauffacher,** elected vice-president in charge of finance. **Raben C. Schenk,** named acting control officer.

John K. Foster, named vice-president and treasurer, **The Shenango Furnace Co.,** and its subsidiary, Shenango-Penn Mold Co.; **A. L. Fairley, Jr.,** becomes vice-president in charge of all raw material operatings including sales and purchases, **The Shenango Furnace Co.;** and **Benton W. Norton,** appointed vice-president, **The Shenango-Penn Mold Co.,** and **W. Laird Davis** is the new secretary.

Edward J. England, appointed executive vice-president, **The United States Railway Equipment Co.,** Chicago.

James R. Turnbull, appointed vice-president, **Monsanto - Kasei Kogyo, K.K.,** an associate company of **Monsanto Chemical Co.** in Tokyo.

Dunstan S. Gross, named a vice-president, **Friden Calculating Machine Co., Inc.,** San Leandro, Calif.

Kenneth Rush, vice-president, placed in charge of the company's activities outside the U. S. and Canada, **Union Carbide & Carbon Corp.,** New York. He also was made a member of the appropriations committee.

Harold Burrow, N. W. Freeman, R. C. Graham, C. A. Lingo, W. C. McGee, Jr, and **R. L. McVey,** promoted to senior vice-presidents, **Tennessee Gas Transmission Co.,** Houston.

L. W. Long, named general manager Terre Haute Works, **Allis-Chalmers Mfg. Co. Martin L. Carson,** placed on a special assignment in vice-president J. L. Singleton's office. **John F. Chipman,** becomes assistant chief engineer, Switchgear Department.

Dr. Leland G. Cole, director of the dynamics laboratory; **Dr. W. M. Roberds** and **Maynard D. McFarlane,** research scientists and **C. J. Thompson,** chief design engineer, have joined the staff of **Robertshaw-Fulton Controls Co.** Aeronautical Div. research and development laboratory.

H. T. Coghill, has joined the sales staff of The Refractories Division of **The Carborundum Company** and is now working in the Cincinnati territory.

William L. Hullsiek, named manager of sales planning for refrigeration products, Kelvinator Div., **American Motors Corp.**

EDWIN C. EVANS, made vice-president and assistant general manager, Behr-Manning Corp., Troy, N. Y.

JOSEPH W. KENNEDY, JR., appointed vice-president, Ohio Seamless Tube Div., Copperweld Steel Co.

J. G. MITCHELL, appointed vice-president - Manufacturing, railway car equipment, Canadian Car & Foundry Co., Ltd.

WILLIAM I. CLARK, JR., secretary, becomes assistant to the president, Behr-Manning Corp.

John J. Dwyer, elected secretary and general counsel, **Oglebay, Norton & Co.,** Cleveland; **G. C. Nichols,** becomes assistant secretary; and **George E. Guthery,** appointed assistant secretary and assistant treasurer.

Dr. William R. Clough, becomes senior research assistant with the Metals Research Group, **Electro Metallurgical Co.,** Metal Research Laboratories, Niagara Falls, New York; and **Arthur L. Geary,** becomes senior research assistant in the Metals Research Group also.

William C. Heard, appointed domestic sales manager, **The Capewell Mfg. Co.,** Hartford, Conn.

George M. Roberts, named Charlotte, N. C., district sales manager, Delta Power Tool Div., **Rockwell Mfg. Co.,** Pittsburgh.

Chester F. Lenik, becomes application engineer, Minneapolis branch office, **Vickers Inc.; Alan R. Wickham,** becomes application engineer, Tulsa office; and **James W. Kelley,** becomes application engineer, Brookfield, Ill.

George Karian, has been transferred to Philadelphia sales staff as a specialist on tabletting and powder metal presses, **F. J. Stokes Machine Co.**

A. Ray Wagner, appointed southwest district resident sales and service engineer, **The Swartwout Co.**

H. A. Strohman, transferred to Harrisburg, Pa. office, **Cummins Engine Co., Inc.,** Columbus, Ind.; and **M. W. Brooks,** becomes regional manager-Midwest District, Central Region, St. Louis.

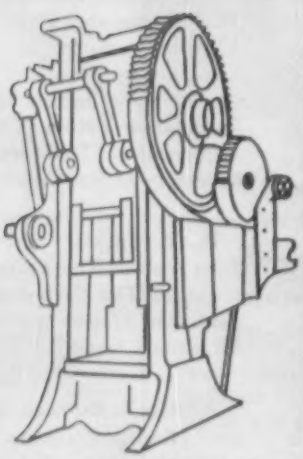
GORDON McMILLEN, becomes assistant vice-president, Canadian Car & Foundry Co.

JOSEPH F. JANECKE, appointed market development engineer, Chicago Vitreous Corp., Cicero, Ill.

ALBERT C. REDDING, appointed technical and development engineer, Crucible Steel Co. of America, Pittsburgh.

DONALD W. COULSON, appointed production superintendent, Coleman Co., Inc., Wichita.

LET SIMMONS REBUILD AND MODERNIZE YOUR PRESSES



Investigate the important production, maintenance and tax savings of SIMMONS ENGINEERED REBUILDING for your: Lathes, Planers, Surface Grinders, Cylindrical Grinders, Vertical Millers, Openside Planers, Automatics, Vertical Boring Mills, Turret Lathes and Radial Drills.

A qualified Simmons rebuilding engineer will discuss it with you. Write, wire or phone today. Simmons Machine Tool Corporation, 1721 North Broadway, Albany 1, N. Y.

SIMMONS MACHINE TOOL CORP., 1721 North Broadway, Albany 1, N. Y.

Unconditional guarantee . . . our standard since 1910

Why Allegheny Ludlum's improvement program features 130 TIMKEN® roll neck bearings

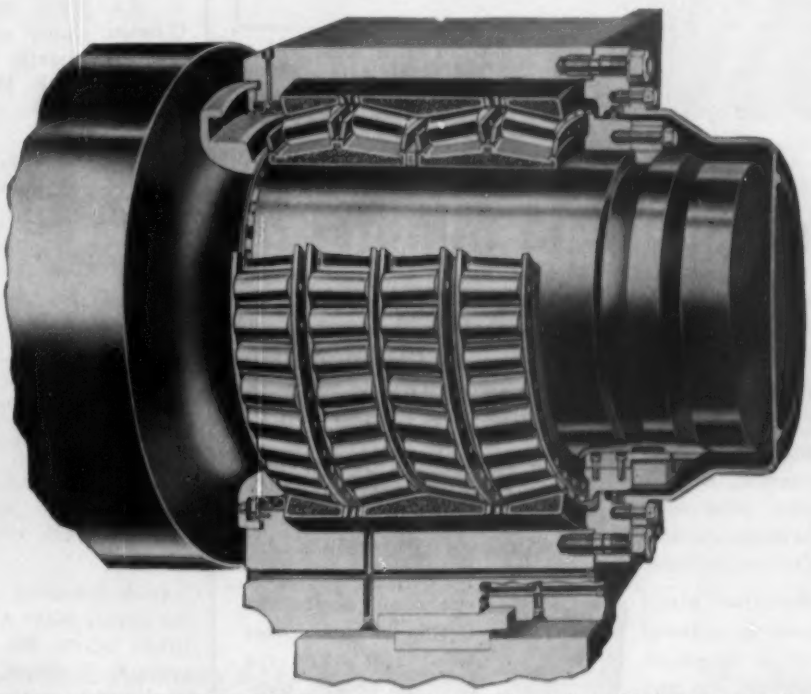
DOLLAR for dollar, Timken® roll neck bearings can't be beat—and mill records prove it. Actual cost figures show Timken bearing equipped mills operate at minimum bearing cost per ton of steel rolled! Allegheny Ludlum Steel Corporation has put 130 new Timken roll neck bearings on mills in the Brackenridge and Leechburg plants. It's part of their extensive program of improvements.

Timken bearings eliminate complicated lubrication systems, make roll changing easier and faster. Maintenance and repair time is cut.

The tapered design of Timken bearings lets them take both radial and thrust loads in any combination so that special thrust units are not required. And Timken bearings can take the heaviest mill loads. Line contact between rollers and races gives Timken bearings extra load-carrying capacity.

Mills accelerate more rapidly with Timken bearings because they lower starting resistance, reduce skidding and scuffing between work rolls and back up rolls. Over 50 years of bearing research and development have made Timken bearings first choice throughout industry. For more information about Timken roller bearing applications, write The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO."

This symbol on a product means its bearings are the best.



ALLEGHENY LUDLUM STEEL CORPORATION *mounts work and back up rolls on Timken tapered roller bearings to get less friction, longer life. Typical Timken roll neck bearing application is shown in cutaway.*

IT'S TIMKEN BEARINGS FOR VALUE!

To get the best value in bearings you may find this simple formula helpful:

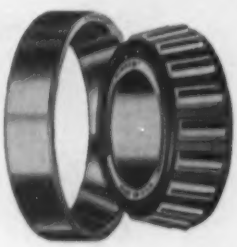
$$Value = \frac{quality + service + public\ acceptance}{price}$$

Obviously a big advantage *above* the line gives you more value than a small one *below*. No other bearing can match the uniform high quality, engineering and field service and overwhelming public acceptance you get with Timken bearings.

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS



NOT JUST A BALL NOT JUST A ROLLER THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION

Are you too busy to learn why the management of many firms will buy a $50,000 machine without batting an eye, and haggle over a $50 gage to go with it? It will pay you to find time to read the free booklet, "A Management Blind Spot."

Can You Spare 15 Minutes?

That's all the time required to read one of the most provocative booklets ever published . . . a factual analysis of the basic reasons why many factories fail to meet work specifications.

"A Management Blind Spot" is the title of this easy-reading booklet. Constructive criticism, softened by humorous cartoons, points out hidden profit leaks and how to stop them.

There's nothing theoretical about this booklet. It's based on studies of conditions in hundreds of plants. Until you read about them, you can't be sure that they don't exist in *your* plant. If they do exist, your reading of this booklet can very well be the first step toward higher quality standards at lower over-all costs. Several case histories show how other firms achieved profitable results.

Write for your free copy today. See how easy it is to save the money that may be winding up in the scrap barrel, the repair parts till or a salesman's expense account. Check your operations against the facts in "A Management Blind Spot". You can have this booklet, without cost or obligation, by return mail.

FEDERAL PRODUCTS CORPORATION
5131 Eddy Street • Providence 1, R. I.

Ask **FEDERAL**

FOR ANYTHING IN MODERN GAGES...

Dial Indicating, Air, Electric, or electronic — for inspecting, measuring, sorting, or automatically controlling dimensions on machines.

Arthur H. Van Wormer, appointed district sales manager, **Cleveland, Vickers Inc.**

William D. Bobco, promoted to assistant manager of the mechanism and dynamics research department, **Armour Research Foundation of Illinois Institute of Technology,** Chicago. **Frederick R. Wunder,** named program development engineer of the mechanism and dynamics research department.

Dennis J. Carney, appointed superintendent of #2 electric furnace, **U. S. Steel Corp.; John E. Harrod,** becomes superintendent of #2 open hearth; **Jack F. O'Brien,** named superintendent of #3 open hearth and Bessemer; and **William R. McLain,** is superintendent of #4 open hearth.

Harlan C. McKay, appointed West Coast representative, **Gemmer Mfg. Co.,** Detroit.

Newt Crum, becomes exclusive representative, **Flexible Steel Lacing Co.**

Ralph V. Esten and **Eugene A. Bedard,** have joined the Industrial Dept., **Wyandotte Chemicals Corp.,** Wyandotte, Mich. Mr. Esten will be in the Los Angeles office, and Mr. Bedard's headquarters are in San Francisco.

G. A. Johnston, named purchasing agent, **Solar Aircraft Co.,** San Diego plant. Mr. Johnston succeeds **R. W. Brick,** who is leaving to become executive secretary-treasurer of the Purchasing Agents' Association of Los Angeles.

Irvin C. Kinney, appointed advertising manager, **Tennessee Coal & Iron Div., U. S. Steel Corp.**

Stanley H. Henry, made technical service representative, Lower Michigan territory, **John B. Moore Corp.;** and **Andrew C. Kasnik,** appointed to handle sales in the Ohio territory.

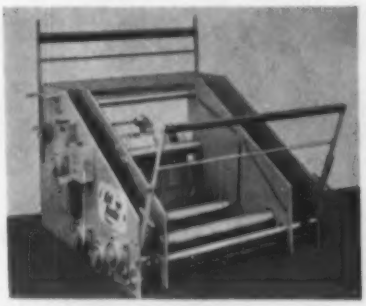
NEW EQUIPMENT

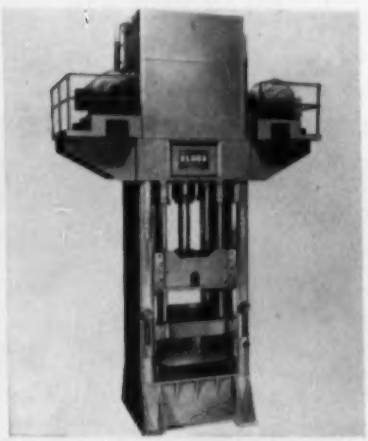
New and improved production ideas, equipment, services and methods described here offer production economies . . . for more data use the free postcard on page 289 or 290

Coil cradle built for automotive requirements

Heavy duty Koil Kradle of 7000 lb capacity accommodates coil stock up to 42 in. diam and 40 in. maximum width, supplying a loop from which any machine can draw with comparative freedom. The Koil Kradle will automatically operate intermittently by means of its vari-loop control or will function continuously at a selected speed, made possible by its variable speed drive. It can be used with punch presses, shears, roll forming equipment, slitters, etc. Two guide plates operated by crank may be adjusted to desired width capacity, centering the coil stock on the power driven rolls. Capacities range from ½ to 8 tons. *Benchmaster Mfg. Co.*

For more data circle No. 52 on postcard, p. 289.





Drawing-forming press offers advanced features

New Elmes hydraulic drawing and forming press is a double-action press equipped with die cushion. It is a housing type self-contained, multiple-ram, moving-down press with preshrunk tie rods that assure maximum rigidity and alignment. Guide ways for slides are hardened steel, affording increased wear resistance and protection against scoring. Use of ring-type keys assures constantly maintained all-directional alignment of press crown, bed and housings. Multiple ram arrangement permits a maximum flexibility of operation: greater pressing speeds are available for work requiring less than maximum press tonnage. For single-action operations of blank-holder and main platen, the respective capacities (blank-holder 100 tons, main platen 300 tons) are combined to obtain a total capacity of 400 tons. Stroke control and speed change adjustments are controlled from front of the press at floor level. *American Steel Foundries, Elmes Engineering Div.*

For more data circle No. 53 on postcard, p. 289.

Gas-fired Homocarb furnaces made in eight sizes

New line of Homocarb gas-fired furnaces are vertical, batch type units, identical with other Homocarb furnaces except for method of firing. Burners are tangential to combustion chamber, number of burners depending on furnace size. Burners are luminous-flame type, regulated by duration-adjusting type temperature control. They produce a long flame which wraps around the furnace retort. The retort becomes a single radiant tube, supplying a uniform wall of heat around the work chamber. Equipment includes a Safe-Start burner control unit, with all gas and air valves, safety interlocks, blower and other accessories. Microcarb control is provided for continuous, automatic regulation of the carbon content of the furnace atmosphere. Work spaces range from 15x18 in. to 25x48 in. Applications of the furnace include carburizing, carbon restoration, hardening, or homogeneous carburizing cycles. *Leeds & Northrup Co.*

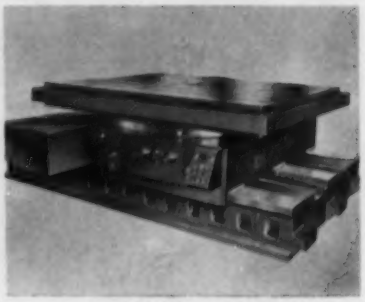
For more data circle No. 54 on postcard, p. 289.

Turn Page

Large rotary table is completely self-contained

A new huge precision rotary table provides additional working area and increased capacity. Available table sizes include: 8, 10 and 12 ft sq platens; 8, 10 and 12 ft round platens; 8 x 10, 8 x 12 and 10 x 12 ft rectangular platens. It is a self-contained power-driven unit having power feeds to the rotating table top and longitudinal traverse along the runway. The table can be used to move the workpiece at right angles to the runway of a floor type horizontal boring machine and also to perform circular milling and indexing operations in one setup. All controls are regulated by pushbuttons. *Giddings & Lewis Machine Tool Co.*

For more data circle No. 55 on postcard, p. 289.



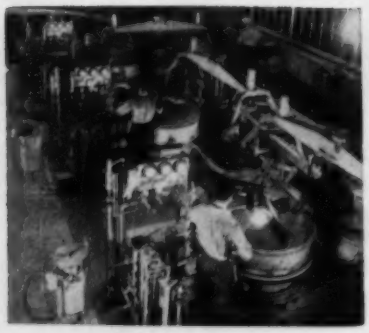
Efficiency keynotes wet-type dust and fume collector

The Van-Truer dust and fume collector consists of a cylindrical drum with a series of cones and baffles. Water, supplied by a direct driven pump, cascades downward within the collector. This action produces a series of closely related water curtains through which the dust-laden air is filtered in its upward travel. A double row of moisture eliminators is mounted above the washing chamber. Access doors in the housing simplify inspection of eliminators and wash chamber. In operation, the dust and fume laden air are in continuous fluid contact during the upward flow. It is claimed that the baffle design sets up a cyclonic washing action and turbulence, separating the wet dust and carrying it to the sludge tank below. Saturated air continues up through two-stage moisture eliminator and emerges completely dry. Truss-suspension, floor-setting or roof models are made. *Van-Truer Co., Inc.*

For more data circle No. 56 on postcard, p. 289.

The CHIP-TOTE conveyor permits complete utilization of machine tools by eliminating shut-down for manual scrap removal.

It handles a continuous flow of hot, wet or dry chips, turnings and borings from any multiple spindle automatic machine.



Powder-starting helps make the wheels go around

Efficient application of Linde's powder-starting process makes the flame-cutting of steel freight car wheel hub holes an economical operation. The wheels are formed by pressure pouring molten steel uphill into permanent graphite molds. While the wheels are still hot, they are placed on turntables, and the hubs are cut out by the oxyacetylene flame from the blowpipe set above each wheel. To pierce the 14-in. steel to start the cut, iron-rich powder, which raises the reaction heat, is forced into the cutting oxygen stream by powder dispensers. After the initial cut has been made, the powder is turned off, and the rest of the hub hole is made by flame-cutting. *Linde Air Products Co.*

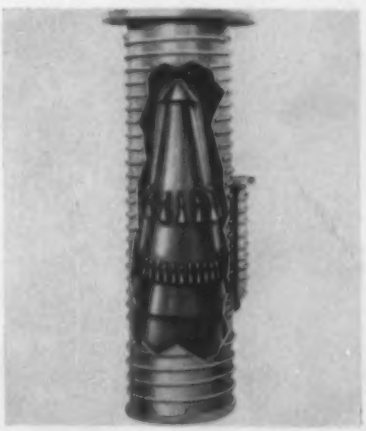
For more data circle No. 57 on postcard, p. 289.

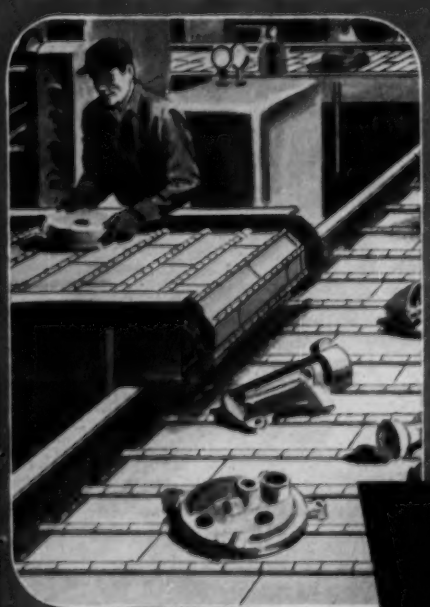
Ring-jet design gives increased pumping capacity

A new line of oil diffusion and booster pumps which have increased pumping capacity over the critical pressure ranges, and will exhaust to substantially higher fore-pressures, has been announced. Both series embody a totally new design concept, called the Ring-Jet, a feature said to increase pumping capacity by from 10 to 100 pct over conventional pumps of similar dimensions and heat output. In all diffusion and booster pumps, the pumping speed is limited by the cross-section area of the air-flow path. This in turn is limited by the permissible distance from the oil jet to the condensing surface. The Stokes Ring-Jet design replaces the conventional jet cone with a ring of jets, permitting the cross-section area of the airflow path to be increased without increasing the distance from jet stream to condensing surface. Pumps are available in a range of sizes from 4 to 16 in. *F. J. Stokes Machine Co.*

For more data circle No. 58 on postcard, p. 289.

Turn Page





Now is the time to put AUTOMATION to work . . . Now is the time to cut production costs . . . May-Fran engineers design and build complete scrap handling systems for the automatic removal of machine turnings or chips. May-Fran conveyors will transmit scrap to ultimate point of disposal.

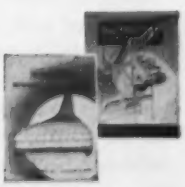
Press Scrap systems can be made completely automatic. Hinged-steel belt will take scrap from presses, handle it through blanking, shearing, forming and baling processes, and deliver it to rail cars.

May-Fran is prepared to engineer, fabricate and install complete conveyor systems to your specifications.

Write today for complete information on how an automatic scrap removal system will cut your production costs.

Bulletin MF-530 describes the new Hinged-Steel conveyor belt.

Bulletin MF-640 describes the Chip-Tote conveyor which removes scrap from operating machines.



DESIGNERS AND ENGINEERS OF COMPLETE SCRAP HANDLING SYSTEMS

MAY-FRAN ENGINEERING, INC.

Hinged-steel belting handles scrap as well as hot heavy and abrasive castings. Belt is economical . . . maintenance-free.

1698 CLARKSTONE ROAD
CLEVELAND 12, OHIO

"Certified" does a better job in less time at lower cost.

Why? Because "Certified" Samson Shot and Angular Grit is made *extra-tough. Extra-tough* to clean more thoroughly, more quickly. *Extra-tough* to last . . . to be reused again and again without breaking down.

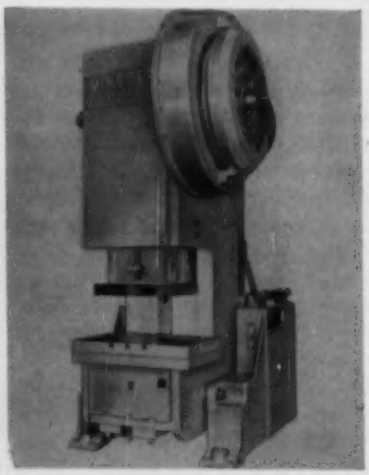
It all adds up to lower time, labor, and abrasive costs for you. See for yourself! Switch to the abrasive made by the oldest abrasive manufacturing company in the world . . . switch to "Certified" Abrasives!

THE STANDARD OF EXCELLENCE FOR OVER 60 YEARS

PITTSBURGH CRUSHED STEEL CO., Pittsburgh, Pa.
STEEL SHOT AND GRIT CO., Boston, Mass.

Gap presses

One of a group of new, smooth-lined, fabricated steel gap presses is the G1 - 110-ton model especially adapted to automation. It has built-in panel-leg control cabinets containing all electrical, air and lubrication controls for press or automation equipment. Presses may be fixed or inclinable base. Massiveness of the steel frame sections in-



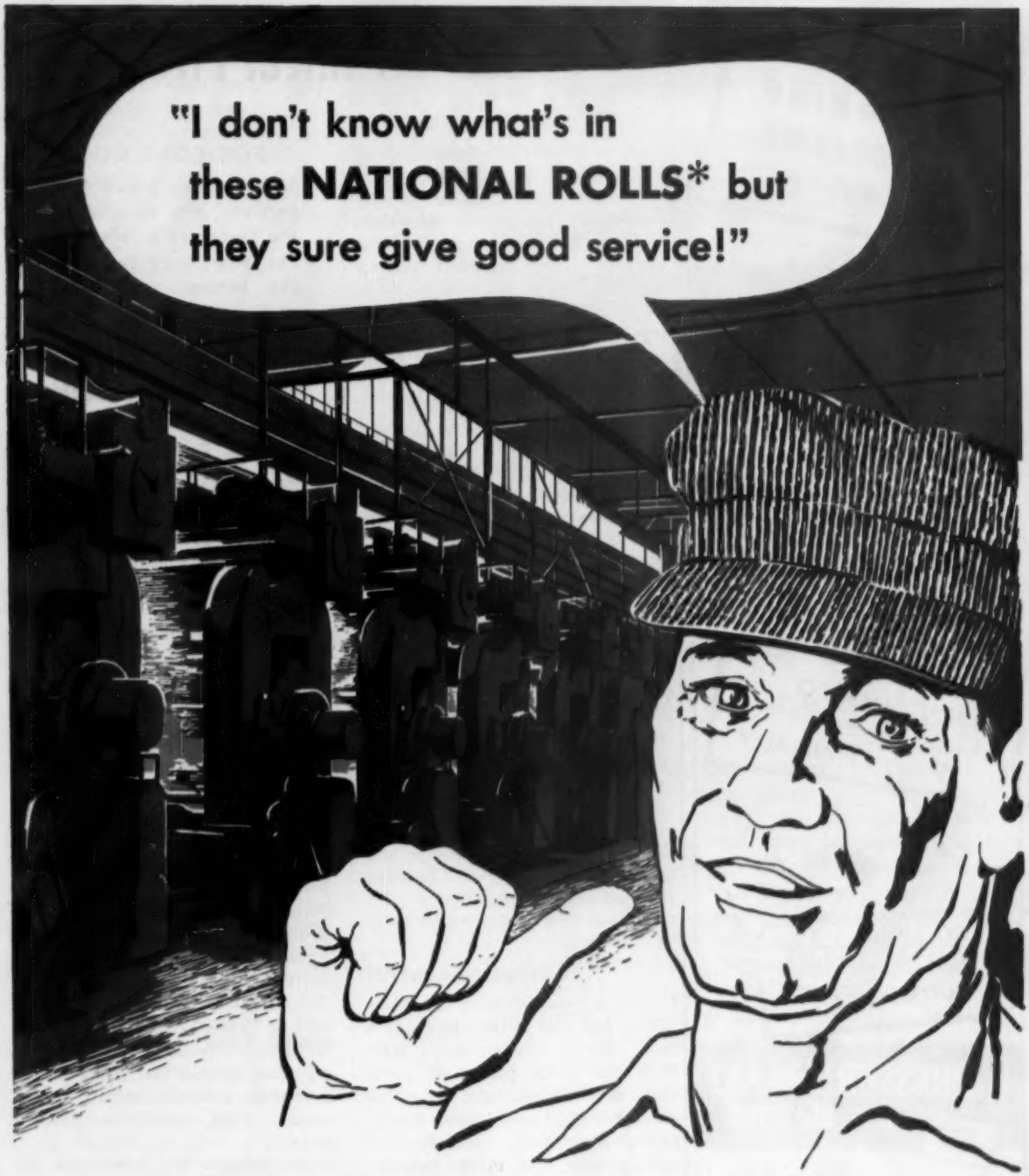
crease compressive strength for minimum deflection in steel C frame construction and builds up vibration dampening qualities. Crankshafts are machined, ground and roll burnished for extra fine, tough surface. The 110-ton presses have standard slide stroke of 5 in. with 80 or 105 strokes per min on flywheel press or 37 strokes per min on geared press; bed area 27 x 42 in.; slide area 21 x 28 in. *Minster Machine Co.*

For more data circle No. 59 on postcard, p. 289.

Ingot conditioning

Surface imperfections extending about ¼ in. into ingot surfaces can be eliminated by surface conditioning. An electric arc plays on the rotating ingot so that the entire surface is progressively melted in a helical path. The operation is carried out in a water-cooled furnace chamber under inert atmosphere or vacuum, and is entirely automatic. The equipment is custom designed and built for specific user requirements. *Vacuum Specialties, Inc.*

For more data circle No. 60 on postcard, p. 289.



*You'll find that you will get the most out of a National Roll because into all National Rolls go only the best of materials and craftsmanship . . . so for longer, uninterrupted service, specify National Rolls.

THE NATIONAL ROLL & FOUNDRY CO.

Avonmore, Pennsylvania

Specialists in Iron, Alloy Iron and Steel Rolls and Castings, Steel Armor Castings

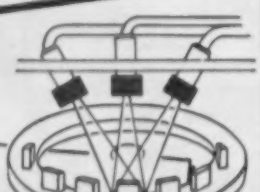
which of these CLEANING PROBLEMS are yours?

CHECK*

- ☐ Insulating coatings
- ☐ Amorphous metal
- ☐ Discoloration
- ☐ Lacquer
- ☐ Plastic flash
- ☐ Rubber flash
- ☐ Glass flash
- ☐ Enamel flash
- ☐ Imbedded metal
- ☐ Lead deposits
- ☐ Carbon
- ☐ Brazing flux
- ☐ Weld spatter
- ☐ Stains
- ☐ Heat treat scale
- ☐ Radio-active oxides
- ☐ Dirt
- ☐ Grease
- ☐ Oil
- ☐ Rust
- ☐ Varnish
- ☐ Paint
- ☐ Plate
- ☐ Core sand
- ☐ Silicate coatings
- ☐ Excess solder
- ☐ Ceramic deposits
- ☐ Graphite
- ☐ Slag
- ☐ Polishing compound

DO IT MANUALLY

OR



DO IT AUTOMATICALLY

WITH PRESSURE BLAST WET BLASTING

TWO SPEED

* This ad is your coupon. Check off your problem(s) and mail today for free illustrated literature . . . application data . . . case history information!

CRO-PLATE COMPANY INC.

747-2 WINDSOR STREET
HARTFORD 5, CONNECTICUT

FREE AIDS

New Technical Literature:

FOR YOUR COPY

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, page 289.

Cleaning castings

How to attain high cleaning rates in foundries on castings which will withstand tumbling is the subject of a new booklet on airless abrasive blast cleaning. It gives the case history of a 63-ft cleaning machine which cleans 2 to 3-ton loads of miscellaneous steel castings in only 15 minutes. It also relates how other important benefits were gained through the use of this method. The booklet is illustrated, showing the machine in actual operation in a steel foundry. *American Wheelabrator & Equipment Corp.*

For free copy circle No. 1 on postcard, p. 289.

Forgings

Any company needing stock industrial forgings and automotive forgings, or forgings to specification, will be keenly interested in the new 40-page Catalog 19A recently published by this company. Well illustrated with photographs and detailed engineering drawings, this catalog lists dimensions, details, tables, sizes and specifications of almost every stock forging type produced for the automotive and industrial fields. *The Cleveland Hardware & Forging Co.*

For free copy circle No. 2 on postcard, p. 289.

Corrosion control

Corrosion control with stainless tubing and pipe is the subject of a new 28-page booklet. It is fully illustrated with photos of parts and applications, and contains corrosion resistance tables, charts, field reports from users, detailed test results and other valuable engineering information. While covering many stainless alloys, it also describes the characteristics and performance of several super corrosion-resistant steels. All main types of corrosion are discussed. It also gives helpful information on selection of alloys for specific conditions. *Alloy Tube Div. of The Carpenter Steel Co.*

For free copy circle No. 3 on postcard, p. 289.

Milling machines

Three styles of the new Cincinnati Toolmaster milling machines are fully described in this detailed brochure. Model 1A has a manual feed to quill, Model 1B has power feed to the quill and Model 1C is equipped with a heavy duty head. For all models, the booklet describes design highlights and benefits, features exclusive to the line, also specifications, equipment and attachments. There are functional diagrams of the three models as well. *The Cincinnati Milling Machine Co.*

For free copy circle No. 4 on postcard, p. 289.

Red lead paints

The ninth in a series of Red Lead Technical Letters contains five formulations of red lead developed to meet the requirements for the protection of galvanized steel under varying conditions. It is entitled "Red Lead Paints for Galvanized Steel, Rusted, Weathered or Treated New." The formulations are offered in two groups—one coat finishes and primers for use under selected compatible top coats. *Lead Industries Association.*

For free copy circle No. 5 on postcard, p. 289.

Tires

Bulletin TD-200 describes a "torture" test which the Monarch Rubber Co. has put its Mono-Cushion lift truck tires through along with tires made by two competitive companies. Actual photos taken while the tests were in progress are shown. *The Monarch Rubber Co.*

For free copy circle No. 6 on postcard, p. 289.

Catalogs & Bulletins

Industrial service

A new folder prepared for management executives, engineers, production managers and other key personnel describes how a cooperative group service can tap new sources of profits through product and procurement research. It lists the objectives and services available to legitimate manufacturing enterprises—without obligation—in Southern California. *Industrial Manufacturing Services Corp.*

For free copy circle No. 7 on postcard, p. 289.

Pyrometers

The featured Model 580 Indicating Pyrometer and Bristol's complete line of millivoltmeter pyrometers and accessories are described and shown in the company's new 12-page bulletin. *The Bristol Co.*

For free copy circle No. 8 on postcard, p. 289.

Air valves

A new solenoid valve-piloted air valve has been added to the Beckett line of "Hi-Cyclic" air and hydraulic valves. Inexpensive and extremely compact, the new valve is capable of higher actuation rates and will operate on shorter electrical signal, with shorter reaction time, than most valves of its type. It is available in two models, a single solenoid, spring return, and double solenoid. *The Beckett-Harcum Co., Inc.*

For free copy circle No. 9 on postcard, p. 289.

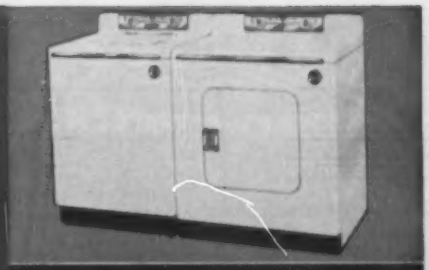
Fork trucks

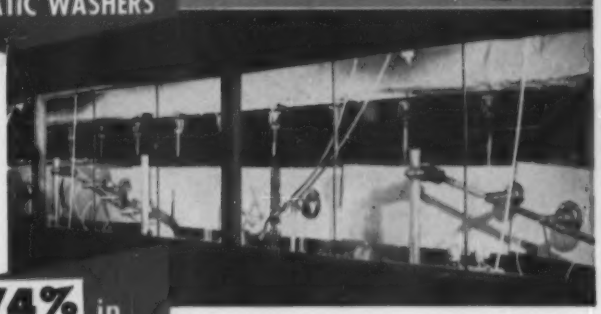
Lewis-Shepard Products has available two new circulars describing their Model "M," a high lift electric straddle-type fork truck, and their Narrow "M" Model, which is only 32 in. wide at the operator's end. Both trucks are available in 2000- and 3000-lb capacity. Designed for safety, the operator enters the truck from the side and is protected from collision by a wrap-around reinforced steel compartment 36 in. high. *Lewis-Shepard Products, Inc.*

For free copy circle No. 10 on postcard, p. 289.

Turn Page

with the
RANSBURG NO. 2 PROCESS
Paint mileage jumps
84%
in the finishing of
G-E AUTOMATIC WASHERS





...and **74%** in finishing G-E DRYERS

Production is increased and quality of the work is improved over former hand spray method

● When General Electric formerly hand sprayed their home laundry equipment—automatic washers and dryers—they painted 9.74 washers with a gallon of paint. Now, in the new and modern plant at Appliance Park, Louisville—where they're using the Ransburg No. 2 Process—they get 17.97 units per gallon of paint. An increase of 84%!

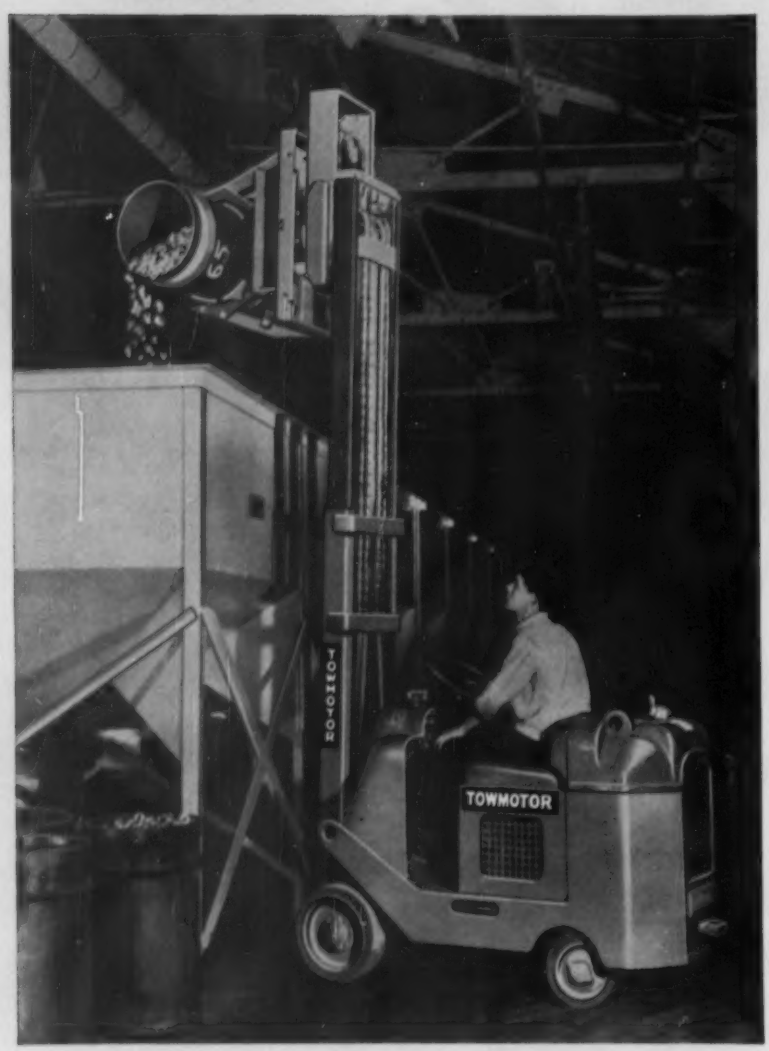
And, where they formerly got 5.49 dryers per mixed gallon of finish, now—with the Ransburg No. 2 Electrostatic Spray Process—they get 9.56 dryers per gallon of paint. An increase of 74%!

Along with increased production, G.E. is getting a more uniform, higher quality finish. Another typical, on-the-job-example of the unmatched efficiencies of the Ransburg No. 2 Process of electrostatic spray painting!

Want to know what Ransburg Electrostatic Processes can do for you in your finishing department? Ask about the complete facilities for test-painting YOUR products—under simulated production conditions—in Ransburg laboratories.

Ransburg ELECTRO-COATING CORP.
Indianapolis 7, Indiana

TOWMOTOR
THE ONE-MAN-GANG
FORK LIFT TRUCKS
at Columbia Malleable Castings Corporation



300% PRODUCTION INCREASE

. . . Overall Handling Costs Cut 60%

Job-Planned Towmotors now pour finished parts into hoppers using a Revolving Barrel Grab. Parts feed down to a weighing conveyor and are bagged mechanically for shipment. Manual filling was eliminated and output per man increased 300%. Overall, Towmotor cut handling costs 60%.

Towmotor equipment does wonders in every plant where handling is a problem. For more information write for Job Studies covering your industry, your competition. TOWMOTOR CORPORATION, Div. 1501, 1226 East 152nd Street, Cleveland 10, Ohio.

FOR FAST ACTION—See a Material Handling Specialist—your nearby Towmotor Representative. His factory training will show you the quickest way to attain maximum handling efficiency at minimum cost.

Surface grinder unit

Model "C" Cylindex cylindrical grinding attachment is featured in a new brochure which describes many improvements just made on this unit. Changes include heavier motor, new adaptor plate to grind tapers up to 45 deg., a method of grinding milling cutters and the addition of hardened ground steel ways. It also shows several other features designed to improve operation and make work removal easier. *Binghamton Die & Machine, Inc.*

For free copy circle No. 11 on postcard, p. 289.

Metal cleaners

Organic nitroparaffins and derivatives are listed in this technical data sheet. Two of the compounds are classified as effective reducing agents for metal ions. A third is said to be useful in metal cleaners and lubricants, and also serves as an emulsion stabilizer and acid acceptor. The reducing agents will also act as effective rust and polymerization inhibitors, according to the manufacturer. Other paraffin chemicals serve as emulsifying agents. *Commercial Solvents Corp.*

For free copy circle No. 12 on postcard, p. 289.

Stainless valves

A line of stainless steel gate valves is described in this new booklet. In addition to drawings of the valves the booklet includes a section on design factors, a discussion of construction materials, standards, and quality control measures. Valves shown have specific applications for "heavy" and "fine" chemicals, for pharmaceuticals, and other corrosive conditions. A table lists the major stainless alloys with designations and applications. *Cooper Alloy Foundry Co.*

For free copy circle No. 13 on postcard, p. 289.

Welding titanium

The welding of titanium and its alloys presents problems not unlike those found in other metals, but they are greatly magnified. The two major difficulties in titanium welding are air contamination and changes in thermal conditions occurring at or adjacent to the weld. *Mallory-Sharon Titanium Corp.*

For free copy circle No. 14 on postcard, p. 289.

FREE TECHNICAL LITERATURE

Hot metal cars

A sparkling 4-color cover starts off a new booklet on hot metal cars that should interest steel plant men because of the quality of its pictures, the facts presented with each. Advantages cited include low heat loss, tendency of linings of this type car to retain heat longer between casts. In addition to noting these and other advantages over open top cars, the booklet lists design features of Treadwell cars. *M. H. Treadwell Co., Inc.*

For free copy circle No. 15 on postcard, p. 289.

Tubing

Users of stainless steel and high alloy tubing will be interested in a 48-page booklet written especially for them by Trent Tube Co. It illustrates and describes tubing manufacturing methods from metallurgical testing at the start, through welding, cold working, etc., to final inspection. Tables in the booklet show physical, chemical, and electrical properties of Trentweld stainless steel tubing and physical and chemical properties of other alloys. *Crucible Steel Co. of America.*

For free copy circle No. 16 on postcard, p. 289.

Saws

Designed as a working tool, a new catalogue is said to have an easier-to-read method of presentation of the facts on saws. It uses non-technical language to tell where each type of saw is used, who uses it and why. In addition to the regular catalogue, there's also a pocket size edition for ready reference. *Atkins Saw Div., Borg Warner Corp.*

For free copy circle No. 17 on postcard, p. 289.

Wall chart

An ideal chart for shop or tool room use showing decimal equivalents and tap drill sizes for wire gauge, letter size and fractional size drills. It is printed in three bright colors for easy legibility, sturdy, and punched for wall hanging. *Chicago - Latrobe, Div. of United Drill & Tool Corp.*

For your copy write on your company letterhead to address shown on reply card.

Turn Page

UDYLITE ANNOUNCES

A NEW, SUPERIOR BARREL PLATING CYLINDER

MADE OF TEMPRON HARD RUBBER

WITHSTANDS, EVEN UNDER LOAD, THE HIGHEST TEMPERATURES USED IN PLATING

•

HAS GREATER RESISTANCE TO ABRASION

WITHSTANDS STRONGER ACIDS

•

CAN BE USED EFFECTIVELY THROUGH THE ENTIRE PLATING CYCLE

ANOTHER UDYLITE FIRST!

After months of research and testing in actual production, Udylite is proud to present a new plating barrel made of Tempron hard rubber.

Users of horizontal plating barrels have for years desired a cylinder made of such a material that would withstand the highest plating temperatures—chemical resistance to a wide variety of corrosive solutions—strength to handle heavy loads and a material that would perform satisfactorily through the complete cycle of operations.

Such a material was found in Tempron hard rubber. It resists most inorganic chemicals and it also has good resistance to many organic chemicals which attack hard rubber, soft rubber and plastics.

Using this material, Udylite's design (patent pending) and construction now give all the features long desired by the plating industry. Udylite's new construction with its interlocking panels and ribs gives the advantage of "one-piece" construction plus the added feature that the panels, ribs, rails and cylinder heads are individually replaceable.

Udylite Tempron cylinders are so designed that they can replace existing types of cylinders in Udylite Barrel equipment.

If you are interested in receiving a sample of Tempron hard rubber for a test in your solutions, or a chart showing the chemical resistance of Tempron, write today to—

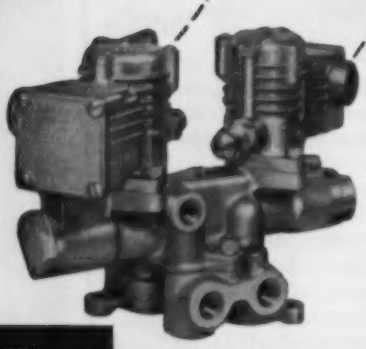
WORLD'S LARGEST PLATING SUPPLIER

THE Udylite CORPORATION

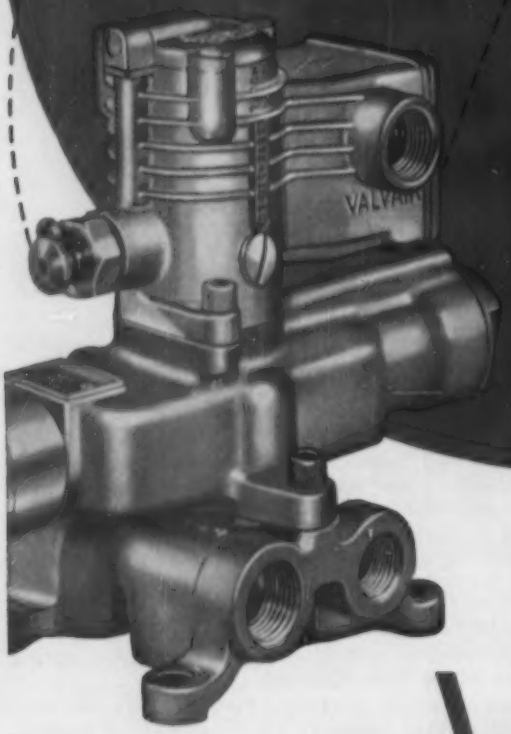
DETROIT 11, MICHIGAN

DOUBLE

solenoid
pilot operated
control valve



SPEED KING



Valvair is proud to announce another advancement in the field of automation—The Double Solenoid Speed King Control Valve, designed especially for both the Original Equipment Manufacturer and the End User. This development assures that, more than ever before, Valvair is the name to keep in mind when you order solenoid-operated valves.

Features: Momentary electrical contact—35 to 200 psi pneumatics with internal pilot supply—35 to 150 psi hydraulics with internal pilot supply—Vacuum—300 psi pneumatics and hydraulics using external or remote pilot supply—4-way body—foot or manifold mounting—basic ⅜" and ¼" sizes.

ASK FOR BULLETIN A 12

Valvair

963 BEARDSLEY AVENUE • AKRON 11, OHIO

Affiliate: Sinclair-Collins Valve Company

Representation in: Baltimore • Birmingham • Boston • Buffalo • Charleston, W. Va. • Chicago • Cleveland • Cranford, N. J. • Dayton • Denver Detroit • Eureka, Calif. • Houston • Kansas City, Mo. • Logansport, Ind. • Louisville • Minneapolis • S. Pasadena • Philadelphia • Pittsburgh Portland • St. Louis • Seattle • San Francisco • Syracuse • Montreal • Toronto • Vancouver

FREE TECHNICAL LITERATURE

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

This section starts on page 284

Tool grinding

A complete new line of tool room grinding wheels is described in a brochure entitled "V40 for Tool Room Grinding." Included is a handy tool room chart which spells out recommendations for grinding high speed tool and die steels. Types of wheels available are straight, recessed, straight cup, flaring cup, dish and saucer shaped. Development of these wheels represents the results of several years of specialized research. *The Carborundum Co.*

For free copy circle No. 18 on postcard.

Coil feeding

Presses fed from the Benchmast Koil Kradle described in this new booklet never have to draw against the weight of the coil. The device automatically supplies a slack loop of material which is fed over the actuating bar. This triggers a microswitch as the slack loop tightens. The powered rolls then rotate the coil, forming a new slack loop. A variable electronic time delay eliminates constant starting and stopping of the feed motor. *Benchmaster Mfg. Co.*

For free copy circle No. 19 on postcard.

Aluminum coating

A new coating method, called the Alumi-coat process, is described in a recently issued brochure. It discusses how aluminum and aluminum alloys are coated onto various ferrous metals to improve their properties. *Arthur Tickle Engineering Works, Inc.*

For free copy circle No. 20 on postcard.

Resistance welding

A general machine catalog for electric resistance welding has been prepared by Sciaky Bros. Classified as Bulletin 333, it describes industrial applications, manufacture and service, principles of operation, and types of electric resistance welding machines. *Sciaky Bros., Inc.*

For free copy circle No. 21 on postcard.

Plastic material

How to get the most from a tough, shatterproof, decorative, structural plastic material is explained in this new folder. Offers important engineering and design aid in fabrication of U. S. Royalite. The material can be sawed, sheared, drilled, punched, sanded, cemented, polished and painted. This booklet provides a number of idea uses which can aid the designer in planning new products. The material is acid and alkali resistant. *United States Rubber Co.*

For free copy circle No. 22 on postcard.

Burdox beaver

The Burdox Beaver is a portable, lightweight, versatile cutting machine. It is a powered torch with performances equal to a stationary machine, though retaining the advantages of manual cutting torch. It is easy to handle and easy to put in operation quickly as a result of its lightness and its handgrip, which has been especially designed to ease guiding and handling. *The Burdett Oxygen Co.*

For free copy circle No. 23 on postcard.

Turn Page

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. **1/6/55**

Circle numbers for Free Technical Literature or information on New Equipment:

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60

If you want more details on products advertised in this issue fill in below:

Page .....Product .....

Page .....Product .....

Page .....Product .....

Your Name .....

Title .....

Company .....

Co. Address .....

City ..... Zone .....

State .....

FIRST CLASS
PERMIT No. 36
(Sec. 34.9 P.L.&R.)
New York, N. Y.

BUSINESS REPLY CARD
No postage necessary if mailed in the United States

POSTAGE WILL BE PAID BY

THE IRON AGE
Post Office Box 77
Village Station
NEW YORK 14, N. Y.

BUSINESS REPLY CARD
No postage necessary if mailed in the United States

POSTAGE WILL BE PAID BY

THE IRON AGE
Post Office Box 77
Village Station
NEW YORK 14, N. Y.

FIRST CLASS
PERMIT No. 36
(Sec. 34.9 P.L.&R.)
New York, N. Y.

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. 1/6/55

Circle numbers for Free Technical Literature or information on New Equipment:

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60

If you want more details on products advertised in this issue fill in below:

Page .....Product .....

Page .....Product .....

Page .....Product .....

Your Name .....

Title .....

Company .....

Co. Address .....

City ..... Zone .....

State .....

Improved crane

Two types of improved single girder electric overhead travelling cranes are described in a new booklet. An outstanding feature of these cranes is their accurate control for load spotting. The cranes are designed for light duties, small loads and short spans. They fill the gap where a hand-powered crane is to slow and a normal two-girder crane is too expensive. Close control for spotting is insured by a centrifugal coupling and magnetic brake in the bridge drive. *Dominion Bridge Co., Ltd.*

For free copy circle No. 24 on postcard.

Hydraulic duplicator

The Goodrich Hydraulic Duplicator, a remarkable machine accessory, has repeatedly doubled and even tripled standard machine output. Attached to any current or old-model miller, lathe, shaper or grinder, it slashes labor costs and multiplies production efficiency on all kinds of contour and die-making jobs. *Automotive Service Tools, Inc., Div. of Lansing Die Sinking Co.*

For free copy circle No. 25 on postcard.

Golden anniversary

"The Lively Life and Times of Presteel" are described in an unusual 20 page illustrated booklet published in honor of the Golden anniversary of the Worcester Pressed Steel Co. The booklet traces the company's history from its incorporation in 1904 to the present. Sketches and photographs provide an historically interesting picture of the pressed-steel industry and reflects the industrial development of the Worcester, Mass., area, an early pressworking center. *Worcester Pressed Steel Co.*

For free copy circle No. 26 on postcard.

Chip handling

A new 8-page catalog containing numerous photographs, drawings and descriptive data presents important information on "How to Handle Metal Chips and Borings, Reclaim Cutting Oil." The booklet describes actual installations and provides the yardsticks which can serve as a measure for savings. *National Conveyors Co., Inc.*

For free copy circle No. 27 on postcard.

Bending blocks

A description of bending blocks or welding platens and the stands to hold the blocks is concisely given in a folder published by the Acorn Iron & Supply Co. Accessories used with this equipment is also included. *Acorn Iron & Supply Co.*

For free copy circle No. 28 on postcard.

Filter units

A new series of cartridge type filter unit designed especially for the electroplating and electroforming industries is described in this new booklet. Units are available in a variety of models ranging from 100 to 5000 gal or more per hour. They are made from iron, stainless steel, rubber and plastic for use with all types of corrosive solutions. The units are easy to assemble and disassemble. Cartridges woven with a variety of fabrics to withstand solution can be used. *Comco, Inc., Div. of Enthone, Inc.*

For free copy circle No. 29 on postcard.

Heavy duty vise

An unusual vise, in a class by itself, combines a number of features in one tool. The combination of several locking devices permits the vise to be used as a universal fixture for a variety of bench work. The vise swivels at three points. It can be raised or lowered, rotated vertically or horizontally. The special design permits rotation of 360° in any direction. These features enable the operator to position the work where it will be most convenient. *FleziVise Co.*

For free copy circle No. 30 on postcard.

FOR MORE LITERATURE

Many companies offer free literature and other information in their advertisements. For the names of these firms see the company listings in the index of advertisers.

Contact KAYDON Muskegon

FOR ALL TYPES OF BALL AND ROLLER BEARINGS: 4" BORE TO 120" OUTSIDE DIAMETER

Engineered for 50,000,000 revolutions without added lubrication

KAYDON standard size precision needle rollers available in 1/16" to 3/16" diameters, flat or rounded ends.
Tolerance: .0002" on diameter.

KAYDON high-precision needle rollers used in MECHANICS' universal joints

KAYDON high-capacity, precision needle rollers are an integral part of automotive and truck universal joints built by Mechanics Universal Joint Division of Borg-Warner Corp.

KAYDON's low-cost needle rollers perform economically and efficiently at low or high speeds — continuous or intermittent operation. What's more, they're performance-proved for 50,000,000 revolutions or 20,000 miles without additional lubrication.

If, like Mechanics, you manufacture large or small universal joints, requiring needle rollers or any type of ball or roller bearing for applications in aviation, industrial, mining, agricultural and other industries — it will pay you to contact KAYDON of Muskegon.

Write for Catalog!

For complete data on capacity, design, separators, standard and custom designed KAYDON *Reali-Slim* bearings, write for this 24-page catalog, No. 24.

KAYDON Types of Standard and Special Bearings:
Spherical Roller • Taper Roller • Ball Radial • Ball Thrust • Roller Radial • Roller Thrust • Bi-Angular Bearings

THE KAYDON ENGINEERING CORP.

MUSKEGON • MICHIGAN

K-5410

PRECISION BALL AND ROLLER BEARINGS

Get all of these ✓ ADVANTAGES!

FAIRFIELD GEARS

☑ **MASS PRODUCTION ECONOMY**—Large or small, you get the benefits of high production rates and big volume output at FAIRFIELD—the place where fine gears are produced to meet your specifications EFFICIENTLY, ECONOMICALLY!

☑ **QUALITY PLUS**—There is no finer recommendation for the quality of the product you sell than to be able to say that it is "EQUIPPED WITH FAIRFIELD GEARS!"

☑ **DEPENDABLE SOURCE OF SUPPLY**—For more than thirty-five years, Fairfield has served as a dependable, efficient supplier of precision-made, automotive type gears for leading builders of construction, agricultural, industrial, marine, and automotive equipment.

☑ **COMPLETE PRODUCTION FACILITIES**—Fairfield offers unexcelled facilities in a new and ultra-modern plant for producing finest quality Spur, Herringbone, Spiral Bevel, Ground Tooth Spiral Bevel, Straight Bevel, Coniflex Bevel, Hypoid, Zerol, Worms and Worm Gears, Splined Shafts, and Differentials to your specifications.

☑ **ENGINEERING SERVICE**—Fairfield engineers are qualified to make expert recommendations on your gear production requirements. Take advantage of the service offered. *Your inquiry will receive prompt attention.*

FAIRFIELD MANUFACTURING CO.

2319 South Concord Road • Lafayette, Indiana

Fine Gears Made to Order

Send for a copy of this illustrated bulletin describing Fairfield's facilities for making gears.

TRADE ASSOCIATIONS AND TECHNICAL SOCIETIES

A list of some 200 Professional and Technical Societies and Trade Associations in Metalworking and Metal Production.

Air Conditioning and Refrigeration Institute
1346 Connecticut Ave., N.W. Washington 6, D. C.
Managing Dir.: Geo. S. Jones, Jr.

Aircraft Industries Assn. of America
610 Shoreham Bldg., Washington 5, D. C.
Pres.: Admiral DeWitt C. Ramsey, USN (Ret.)

Alloy Casting Institute
32 Third Ave., Mineola, N. Y.
Exec. Vice-Pres.: E. A. Schaefer

Alloy Tank Manufacturers Council
Keith Bldg., Cleveland 15, Ohio
Commissioner: Harry A. Sieck

Aluminum Assn.
420 Lexington Ave., New York 17, N. Y.
Secy.-Treas.: Donald M. White

Aluminum Research Institute
20 N. Wacker Drive, Chicago 6, Ill.
Secy.: Carl H. Burton

Aluminum Roofing Institute
209 Cedar Ave., Washington 12, D. C.
Secy.: D. J. Condon

Aluminum Wares Assn.
1506 First National Bank Bldg., Pittsburgh 22, Pa.
Secy.: Stuart J. Swensson

Aluminum Window Manufacturers Assn.
74 Trinity Place, New York 6, N. Y.
Secy. & Counsel: Herbert S. Blake, Jr.

American Boiler and Affiliated Industries
15 Park Row, New York 7, N. Y.
Mgr.: Henry E. Aldrich

American Boiler Mfrs. Assn. and Affiliated Industries
1571 W. 117th St., Cleveland 7, Ohio
Secy.: A. C. Baker

American Bureau of Metal Statistics
50 Broadway, New York, N. Y.
Director: H. R. Eckert

American Coke & Chemicals Institute
711 Fourteenth St., N.W., Washington 5, D. C.
President: Samuel Weiss

American Die Casting Institute
366 Madison Ave., New York 17, N. Y.
Secy.: W. J. Parker

American Electroplaters' Society
445 Broad St., Newark 2, N. J.
Exec. Secy.: P. Peter Kovatis

American Foundrymen's Society
Golf & Wolf Rds., Des Plaines, Ill.
Secy.-Treas.: W. W. Maloney

American Gas Assn.
420 Lexington Ave., New York 17, N. Y.
Manager, Press Relations: George A. McDonald

American Gear Manufacturers Assn.
One Thomas Circle, Washington 5, D. C.
Exec. Secy.: John C. Sears

American Hardware Manufacturers Assn.
342 Madison Ave., New York 17, N. Y.
Secy.: A. Faubel

American Home Laundry Manufacturers' Assn.
342 Madison Ave., New York 17, N. Y.
Secy.: Arthur L. Faubel

"Alloys for the Furnaces." Agnes Potter Lowrie depicts the ingredients which give steel its special qualities: reddish manganese for deeper hardening; ice-white quartz for flux, flanked (left) by tungsten and (right) by chrome, corrosion preventives for special-purpose steels; dusky lead glistening with molybdenum which maintains hardness at high temperatures; and (bottom row) samples of nickel, molybdenum and chrome, vanadium, copper. Limited edition of 15 x 18 full-color prints available soon. Copy on request.

The Fine Art of Steel Making "V"

Advances in metallurgy have given us *finer* steel than ever before, harder, finer-grained, more resistant to heat, friction, corrosion.

Advances in mechanics have given us *more* steel. Today's four-high mill, for instance, rolls more steel in a single shift than the old-time hand mill produced in a week.

Contributing mightily to more efficient production are equal improvements in the materials which smooth the process of steel making — Ironsides roll neck and roller bearing lubricants.

Roll neck shield, once applied by hand, is now supplied in liquid and semi-liquid form for continuous application by automatic pressure systems. Roll necks may be kept at constant temperature; the roller need not adjust his mill to maintain proper gauge.

More important, roll neck shield is formulated to the special needs of the individual user. For example, to compensate for local water and temperature conditions or to meet personal preferences of mill superintendents.

Roller bearing shield, an extreme pressure lubricant, has load-carrying capacity in excess of bearing manufacturers' standards, assuring a safety factor for peak loads. It carries the approval of all top bearing makers.
Today almost every major steel producer uses Ironsides lubricants. Our unique position is due to our ability to formulate for special applications and supply those formulas in any quantity.

We like tough problems; we've solved a lot of them. For example, Palmoshield, replacement for palm oil and most significant advance in lubrication since World War II. If you have a problem, we'd like to help lick it. A letter will summon one of our research engineers. The Ironsides Co., Columbus 16, Ohio.

SHIELD PRODUCTS

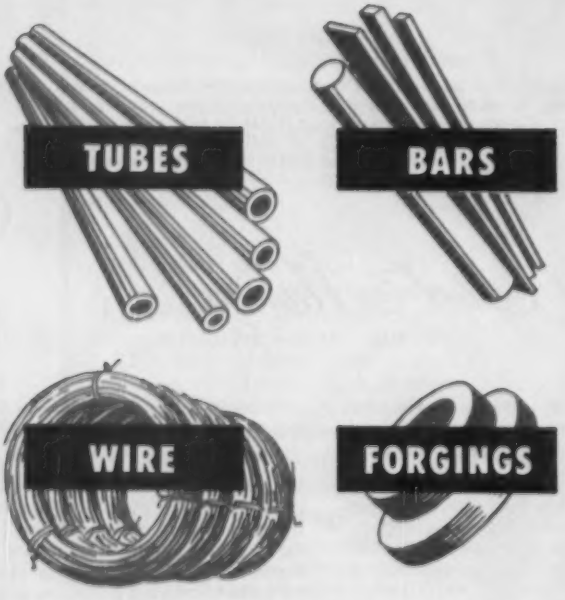
Ironsides

By the makers of Palmoshield • "the palm tree that grows in Ohio"

World's largest stocks of

52100

STEEL TUBING and BARS



Write for the latest stock list

Contact our nearest office or write to Peterson Steels, Inc., Springfield Road, Union, New Jersey. Address: Dept. I

PETERSON STEELS, INC.

UNION, NEW JERSEY

Detroit, Michigan • Chicago, Illinois

TRADE GROUPS

American Home Laundry Manufacturers' Assn.
20 N. Wacker Dr., Chicago 6, Ill.
Exec. Secy.: John J. Reinecke

American Hot Dip Galvanizers Assn.
1506 First National Bank Bldg., Pittsburgh 22, Pa.
Secy.-Treas.: Stuart J. Swensson

American Institute of Chemical Engineers
25 W. 45th Street, New York, N. Y.
Exec. Secy.: Stephen L. Tyler

American Institute of Mining & Metallurgical Engineers
29 W. 39th St., New York 18, N. Y.
Secy.: Edward H. Robie

American Institute of Steel Construction
101 Park Ave., New York 17, N. Y.
Exec. Vice-Pres.: L. Abbott Post

American Iron and Steel Institute
350 Fifth Ave., New York 1, N. Y.
Exec. Vice-Pres.: Max D. Howell

American Machine and Parts Assn.
910 17th St., Washington 6, D. C.
Secy.: D. H. Reynolds

American Machine Tool Distributors Assn.
1900 Arch St., Philadelphia 3, Pa.
Exec. Secy.: Thomas A. Fernley, Jr.

American Manganese Producers Assn.
National Press Bldg., Washington 4, D. C.
Pres.: J. C. Adkerson

American Mining Congress
1200 18th St., Washington 6, D. C.
Exec. Vice-Pres.: Julian D. Conover

American Ordnance Assn.
Mills Bldg., Washington 6, D. C.
Exec. Vice-Pres.: L. A. Codd

American Railway Car Institute
19 East 47th St., New York 17, N. Y.
Secy.: Walter A. Renz

American Society for Metals
7301 Euclid Ave., Cleveland 3, Ohio
Secy.: W. H. Eisenman

American Society for Testing Materials
1916 Race St., Philadelphia 3, Pa.
Exec. Secy.: Robert J. Painter

American Society of Lubrication Engineers
84 E. Randolph St., Chicago 1, Ill.
Admin. Secy.: William P. Youngclaus, Jr.

American Society of Mechanical Engineers
29 W. 39th St., New York 18, N. Y.
Secy.: C. E. Davies

American Society of Tool Engineers
10700 Puritan Ave., Detroit 21, Mich.
Exec. Secy.: Harry E. Conrad

"Here's the dictionary . . . that's a government contract."

Experience proves

EXLO

VANCORAM BRAND

EXTRA LOW-CARBON* FERROCHROMIUM

is an economical and efficient addition agent for a wide range of stainless steels

EXLO® OFFERS YOU...

- high density
- exceptional cleanliness
- high chromium-carbon ratio
- high chromium content
- low silicon content

Have a talk with your nearest Vancoram Representative for full particulars.

*Carbon content .025% max or .06% max — whichever best suits your requirements.

VANADIUM CORPORATION OF AMERICA

420 Lexington Avenue, New York 17, N. Y.

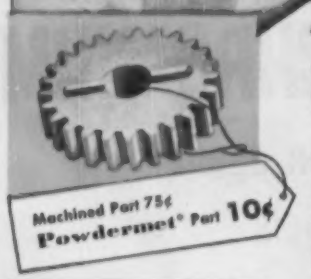
DETROIT · CHICAGO · PITTSBURGH · CLEVELAND

Producers of alloys, metals and chemicals

DON'T CUT PARTS ...Cut Costs!

Why pour money into expensive machining operations?

POWDERED METAL PARTS can do the job for *much less!*



Tough, intricate parts ready for assembly without further processing—at *savings of up to 600% over identical machined parts!* No wonder industry chooses Powdermet.*

Low-cost PM parts are die-pressed to close tolerances, have excellent wearability, and a wide range of alloys are available—many exceeding the tensile strengths of mild steel. Through controlled porosity and electrical permeability, many special properties are achieved . . . such as oil-impregnation for life-time self-lubrication. That's why Powdermet* parts are often the *best parts possible* for gears, bearings, filters, etc.

At Yale & Towne, years of experience and technological know-how in powder metallurgy back up every recommendation on PM parts for *your* particular application.

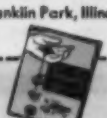
The world's most famous key
. . . symbol of industrial leadership!

YALE & TOWNE
MANUFACTURING COMPANY
PMP *Powdered Metal Products Division*
9335 Belmont Avenue • Franklin Park, Illinois

Get your copy of this informative new booklet now!

*TRADE-MARK

—Send Today For Free Booklet—



The Yale & Towne Manufacturing Company
Powdered Metal Products Division
9335 West Belmont Avenue
Franklin Park, Illinois

☐ Send Booklet ☐ Send information on PM parts for attached specifications or drawings.
☐ Have a Yale & Towne Powdered Metal engineer call on me.

Name..... Title.....
Company.....
Address.....
City..... Zone..... State.....

TRADE GROUPS

American Standards Assn.
70 E. 45th St., New York 17, N. Y.
Managing Dir.: G. F. Hussey, Jr.

American Steel Warehouse Assn., Inc.
442 Terminal Tower, Cleveland 13, Ohio
Pres.: Walter S. Doxsey

American Supply & Machinery Mfrs. Assn., Inc.
2130 Keith Bldg., Cleveland, Ohio
Gen. Mgr.: R. Kennedy Hanson

American Tin Trade Assn., Inc.
75 West St., New York 6, N. Y.
Secy.: Ethel M. Foley

American Welding Society
33 W. 39th St., New York 18, N. Y.
National Secy.: J. G. Magrath

American Weldment Manufacturers Assn.
332 S. Michigan Ave., Chicago 4, Ill.
Pres.: Byrne Marcellus

American Zinc Institute, Inc.
60 E. 42nd St., New York 17, N. Y.
Exec. Vice-Pres. & Secy.: E. V. Gent

Amtea Corp.
30 Church St., New York 7, N. Y.
Secy.: Ralph W. Burk

Anti-Friction Bearing Manufacturers Assn., Inc.
60 E. 42nd St., New York 17, N. Y.
Secy.-Mgr.: H. O. Smith

Assn. of American Battery Manufacturers
First National Tower Bldg., Akron 8, Ohio
Commissioner: V. L. Smithers

Assn. of American Railroads
Transportation Bldg., Washington 6, D. C.
Pres.: Wm. T. Faricy

Assn. of Consulting Chemists and Chemical Engineers
50 E. 41st St., New York 17, N. Y.
Director of Publicity: A. B. Bowers

Assn. of Iron and Steel Engineers
1010 Empire Bldg., Pittsburgh 22, Pa.
Managing Dir.: T. J. Ess

Assn. of Lift Truck & Portable Elevator Mfrs.
P. O. Box 66, Medfield, Mass.
Exec. Secy.: J. A. Goldthwait

Assn. of Roller and Silent Chain Manufacturers
c/o Link-Belt Co., 220 S. Belmont Ave., Indianapolis 6, Ind.
Secy.: C. W. Beauchamp

Assn. of Sprocket Chain Manufacturers
11 S. La Salle St., Chicago 3, Ill.
Exec. Secy.: Mark L. Patterson

Assn. of Steel Distributors
150 Broadway, New York 7, N. Y.
General Counsel: Morris Rosoff

Automobile Manufacturers Assn.
320 New Center Bldg., Detroit 2, Mich.
Managing Dir.: William J. Cronin

Automotive Parts Manufacturers Assn.
800 Michigan Bldg., Detroit 26, Mich.
Gen. Mgr.: Frank Rising

Automotive Tool & Die Mfrs. Assn.
103 Pallister Ave., Detroit 2, Mich.
Managing Dir.: Chester A. Cahn

Band Saw (Metal) Cutting) Mfrs. Assn.
350 Madison Ave., New York 17, N. Y.
Secy.: Robert C. Bell, Jr.

Brass and Bronze Ingot Institute
308 W. Washington St., Chicago 6, Ill.
Secy.-Mgr.: Isadore Glueck

Brass Forging Assn.
420 Lexington Ave., New York 17, N. Y.
Secy.: T. E. Vellfort

Bright Wire Goods Manufacturers Service Bureau
53 Park Pl., New York 7, N. Y.
Secy.: George P. Byrne

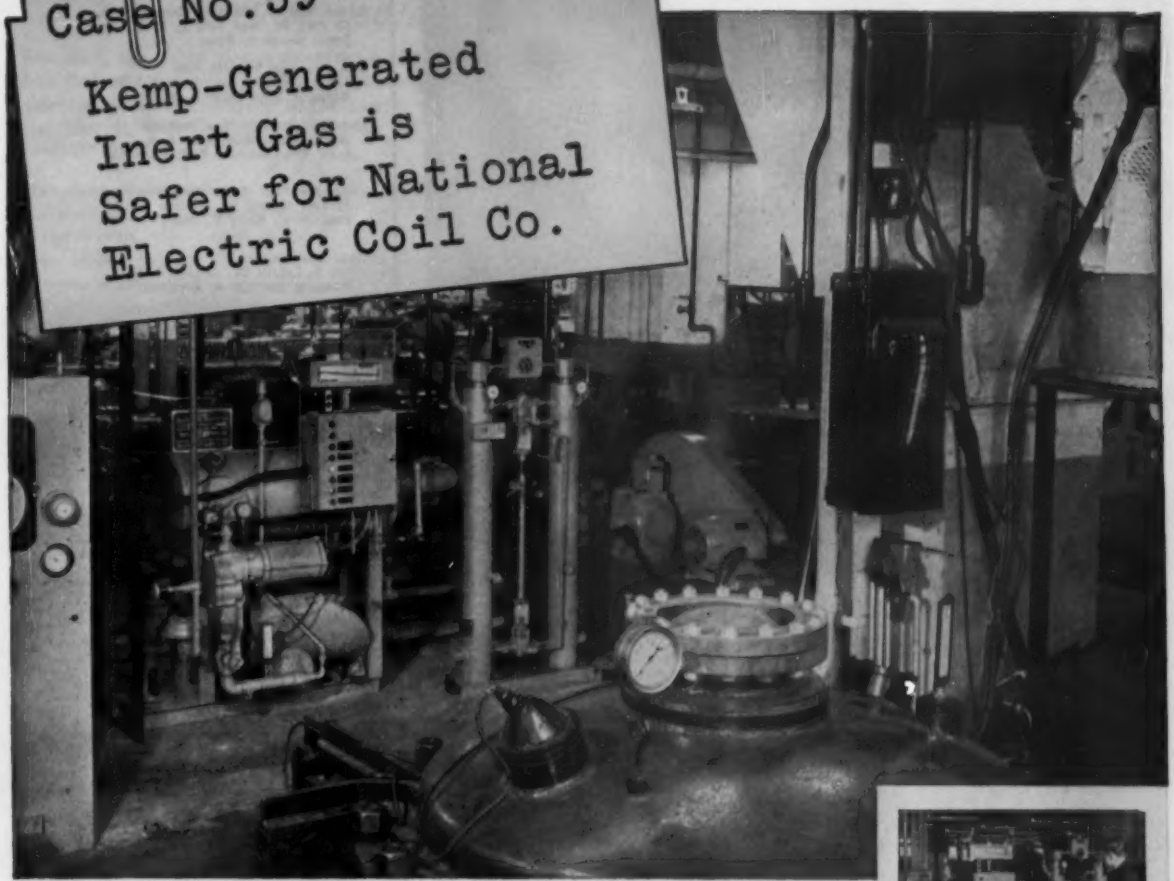
Broaching Tool Institute
74 Trinity Place, New York 6, N. Y.
Secy.: Montgomery S. Blake

Can Manufacturers Institute, Inc.
Shoreham Bldg., Washington 5, D. C.
Exec. Vice-Pres.: H. Ferris White

60 East 42nd St., New York 17, N. Y.
Secy.-Treas.: Clifford E. Sifton

Case No. 59

Kemp-Generated Inert Gas is Safer for National Electric Coil Co.



How National eliminates danger of explosion . . . cheaply and conveniently

National Electric Coil Co., Columbus, Ohio, impregnates electric coils and windings by forcing in a hot sealing compound with inert gas under pressure. Formerly, the Company used air under pressure, but this created an explosion hazard. National then switched to CO_2 generated by melting dry ice. Although this decreased the danger factor, it was an extremely expensive operation and very inconvenient. To modernize this process and cut costs, National installed a Kemp Gas Generator, Model MIHE.

Kemp Solved the Problem—and More

Now National's Kemp installation delivers a completely satisfactory inert—eliminating any danger of explosion. And it delivers it at a *much lower cost* than the former generating method. In addition, Kemp supplies the gas at the rate required, plus a reserve for storage. As for convenience, the company considers their unit entirely automatic—it is practically never touched. According to Mr. D. E. Stafford, Chief Engineer, "It just sits there and operates."

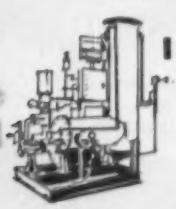
Kemp Can Solve Your Problem Too

Every Kemp Generator is engineered for fast-starting, easy operation that saves both *time* and *money*. Kemp equipment delivers a chemically clean inert at a specific analysis . . . without fluctuations regardless of demand. And every Kemp design includes the latest firechecks and safety devices. For convenience, safety, and cleaner, more dependable gas—specify Kemp.

Mr. Wm. C. Graessle, of the engineering department, checking the operation. Generator features the Kemp Carburetor, part of all Kemp equipment, to deliver complete combustion . . . without waste, without tinkering.

For more complete facts and technical information, write for Bulletin I-10 to: C. M. KEMP MFG. CO., 405 East Oliver Street, Baltimore 2, Md.

KEMP OF BALTIMORE



INERT GAS GENERATORS

CARBURETORS • BURNERS • FIRE CHECKS
METAL MELTING UNITS • ADSORPTIVE
DRYERS • SINGEING EQUIPMENT

TRADE GROUPS

Carbon Wrench Statistical Service
53 Park Pl., New York 7, N. Y.
Secy.: George P. Byrne

Cast Iron Pipe Research Assn.
122 S. Michigan Ave., Chicago 3, Ill.
Managing Dir.: Thos. F. Wolfe

Cast Iron Pressure Pipe Institute
Warner Bldg., Washington 4, D. C.
Exec. Vice-Chairman: S. E. Linderman

Chuck and Floor Truck Manufacturers Assn.
27 East Monroe St., Chicago 3, Ill.
Exec. Secy.: Harry P. Dolan

Chain Institute, Inc.
208 S. LaSalle St., Chicago 4, Ill.
Managing Dir.: D. A. Merriman

Collapsible Tube Manufacturers Assn.
19 W. 44th St., New York 36, N. Y.
Secy.: Lester B. Platt

Colorado Mining Assn.
204 State Office Bldg., Denver 2, Colo.
Exec. Dir.: Robert S. Palmer

Compressed Air and Gas Institute
122 E. 42nd St., New York 17, N. Y.
Secy.: Frank P. Anderson

Compressed Gas Assn., Inc.
11 W. 42nd St., New York 36, N. Y.
Secy.-Treas.: F. R. Fetherston

Concrete Reinforcing Steel Institute
38 S. Dearborn St., Chicago 3, Ill.
Managing Dir.: H. C. Delzell

Connector Manufacturers Assn.
2159 Guardian Bldg., Detroit 26, Mich.
Secy.-Treas.: George W. McCormick, Jr.

Conveyor Equipment Manufacturers Assn.
No. 1 Thomas Circle, Washington 5, D. C.
Exec. Vice-Pres.: R. C. Sollenberger

Copper and Brass Research Assn.
420 Lexington Ave., New York 17, N. Y.
Manager: T. E. Veitfort

Copper Institute
50 Broadway, New York 4, N. Y.
Secy.: R. R. Eckert

Cutting Die Institute
1643 National Bank Bldg., Detroit 26, Mich.
Exec. Mgr.: M. R. Liles

Cutting Tool Manufacturers Assn.
416 Penobscot Bldg., Detroit 26, Mich.
Exec. Secy.: Martin J. Ewald

Diamond Core Drill Manufacturers Assn.
122 E. 42nd St., New York 17, N. Y.
Secy.: Frank P. Anderson

"Oh, go ahead, have some—nothing would dare disagree with you."

Engineered... To YOUR Tooling NEEDS

Ren-ite*, the great dimensionally stable tooling plastic, has been tested and proved by years of research and development. The Ren-ite organization offers unrivaled facilities to help industry cut up to 70% tooling time and 50% of costs.

You can be SURE when you use Ren-ite modified epoxy resins for master Keller models, skin panels, checking and welding fixtures, dies and prototypes, or other tooling applications.

Spotting Fixture

Automobile Hood Duplication

Some of the many uses of Ren-ite tooling plastic and standard stock plastic tubing.

● **FREE ENGINEERING SERVICE— NO CONTRACTS REQUIRED**

Write for illustrated brochure and complete price schedules.

Ren•ite PLASTICS, INC.

POST OFFICE BOX NO. 1256, LANSING 4, MICH.
OFFICES IN CHICAGO, CLEVELAND, DETROIT, LOS ANGELES, NEW YORK AND ST. LOUIS.

*"Ren-ite," "The Dimensionally Stable Tooling Plastic" and "Comminuted for Quality" are Trademarks of Ren-ite Plastics, Inc.

NOW...it's only a one-man job!

You can work anywhere with the Bux Magnetic Drill Press. This portable unit pays for itself during the first few days of operation. It's anchored in place instantly wherever you have a difficult drilling position. Designed for easy drilling, reaming, tapping and countersinking of structural shapes, bar stock, machinery, jigs and fixtures. You'll cut maintenance costs in half and save time on every job.

"Holds still while you drill"

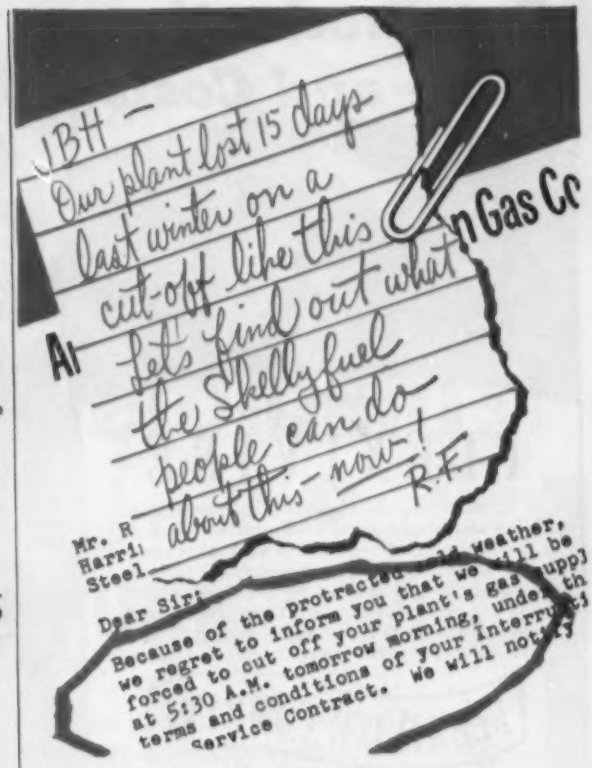
BUX

MAGNETIC DRILL PRESS

- Stand Weight—only 34 pounds
- Drill Stroke—10 inches
- Will drill up to 1⅛" holes
- Magnetic Hold—over 860 pounds
- Operates on 115 volts, AC or DC
- Unconditionally GUARANTEED

WRITE TODAY for descriptive literature and name of nearest dealer.

BUCK MFG. CO.
108 Cypress Ave., Los Gatos, Calif.


IBH —
Our plant lost 15 days last winter on a cut-off like this
Lets find out what the Skellyfuel people can do about this—now!
R.F.
Mr. R
Harri
Steel
Dear Sir:
Because of the protracted
we regret to inform you that we
forced to cut off your plant's gas
at 5:30 A.M. tomorrow morning, unde
terms and conditions of your
service Contract. We will not

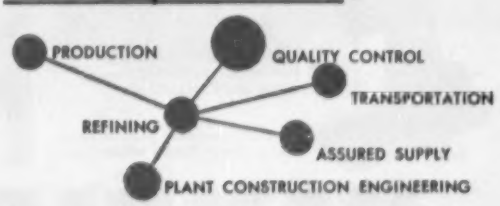
Don't let this happen to YOU!

Would a sudden cut-off of your plant's normal fuel supply deal a knockout blow to your production and your profits?

Get positive protection against costly fuel-gas interruptions and plant shutdowns! Do as scores of leading manufacturers are now doing: protect your plant with a modern propane or butane gas standby plant—designed, engineered, constructed and serviced by Skellyfuel.

We'll be glad to demonstrate to you how the Skellyfuel "one-package" proposition can solve your emergency fuel problems. A call or a letter will arrange a meeting to suit your convenience.

Skellyfuel covers everything from blueprint to BTU!



Skellyfuel Industrial Division, Skelly Oil Company
605 W. 47th Street, Kansas City, Mo.

Cut Production Time and Costs

with

FLEXIVISE

A revolutionary development that saves time, labor and fatigue. Provides complete rotation of 360° in any direction. Positions work to the operator, saving time, labor and physical fatigue. Flexivise is exactly what the name implies; a flexible vise providing a greater range and greater efficiency. 4" jaw width, 5½" jaw opening. Write or wire now for complete information.

FLEXIVISE COMPANY

1149 E. Pico Blvd., Los Angeles, Calif.

Special FlexiSleeve provides a vertical rotation.

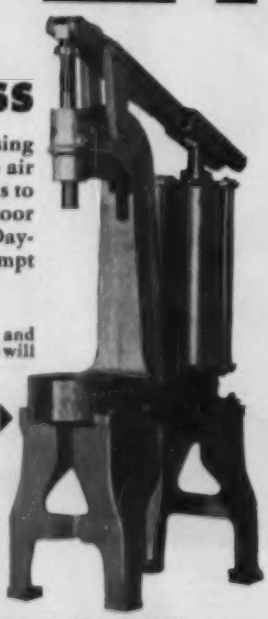
Work can be rotated a full 360° and locked in any position.

Large unwieldly pieces can be held securely by Flexivise.

SAVE!

WITH A HANNIFIN AIR PRESS

It's the ideal press for that occasional pressing job. These presses operate off ordinary shop air supply. They're fast and safe. Over 30 models to choose from...many for either bench or floor mounting. Capacities from ½ to 18 tons. Daylight to 46 inches...reach to 12 inches. Prompt delivery.



WRITE. Complete information and prices on Hannifin Air Presses will be sent on request.

6 Tons (Model B-2) One of more than 30 models. Press with base, $554.

1-ton Hand-D-Press. For small parts manufacturers. Press, $232.

Prices F.O.B. our press plant, St. Marys, Ohio, subject to change without notice.

HANNIFIN

HANNIFIN CORPORATION, 513 S. WOLF ROAD, DES PLAINES, ILLINOIS

TRADE GROUPS

Diesel Engine Manufacturers Assn.
1 N. LaSalle St., Chicago 2, Ill.
Exec. Dir.: Harvey T. Hill

Domestic Water Tank Manufacturers Council
2130 Keith Bldg., Cleveland 15, Ohio
Commissioners: Hunter-Thomas' Associates

Drop Forging Assn.
605 Hanna Bldg., Cleveland 15, Ohio
Secy.-Treas.: Raymond M. Seabury

Edison Electric Institute
420 Lexington Ave., New York 17, N. Y.
Managing Dir.: H. S. Bennion

Electric Furnace Steel Committee, Iron & Steel Div., AIME
29 W. 39th St., New York 18, N. Y.
Secy.: E. O. Kirkendall

Electric Hoist Manufacturers Assn.
71 W. 35th St., New York 1, N. Y.
Secy.: E. Donald Tolles

Electric Overhead Crane Institute
74 Trinity Place, New York 6, N. Y.
Secy.: Montgomery S. Blake

Electric Tool Institute
813 Clark Bldg., Pittsburgh 22, Pa.
Commissioner: R. Kennedy Hanson

Electrochemical Society
216 W. 102nd Street, New York 25, N. Y.
Secy.: Dr. H. B. Linford

Enameled Utensil Manufacturers Council
Keith Bldg., Cleveland 15, Ohio
Commissioners: Hunter-Thomas' Associates

Farm Equipment Institute
608 S. Dearborn St., Chicago 5, Ill.
Exec. Secy.: Robert A. Jones

Fine and Specialty Wire Manufacturers Assn.
839 17th St., Washington 6, D. C.
Secy.-Treas.: Wm. A. Penrose

Forged Tool Society
Law & Finance Bldg., Pittsburgh 19, Pa.
Exec. Secy.: G. D. Shrum

Forging Manufacturers Assn.
366 Madison Ave., New York 17, N. Y.
Secy.: W. J. Parker

Formed Steel Tube Institute
635-37 Hanna Bldg., Cleveland 15, Ohio
Exec. Secy.: John R. Derrickson

Foundry Equipment Manufacturers Assn.
Suite 202, One Thomas Circle, Washington 5, D. C.
Exec. Secretary: C. R. Heller

Foundry Supply Manufacturers Assn.
1508 Law & Finance Bldg., Pittsburgh 19, Pa.
Exec. Secy.: G. D. Shrum

Galvanized Ware Manufacturers Council
Keith Bldg., Cleveland 15, Ohio
Commissioners: Hunter-Thomas' Associates

Gas Appliance Manufacturers Assn., Inc.
60 E. 42nd St., New York 17, N. Y.
Managing Dir.: H. Leigh Whitelaw

Gasoline Pump Manufacturers Assn.
420 Lexington Ave., New York 17, N. Y.
Managing Dir.: G. Denny Moore

Gold Mining Assn. of America
251 Kearney St., San Francisco 8, Calif.
Mgr.: Claude M. Chaplin

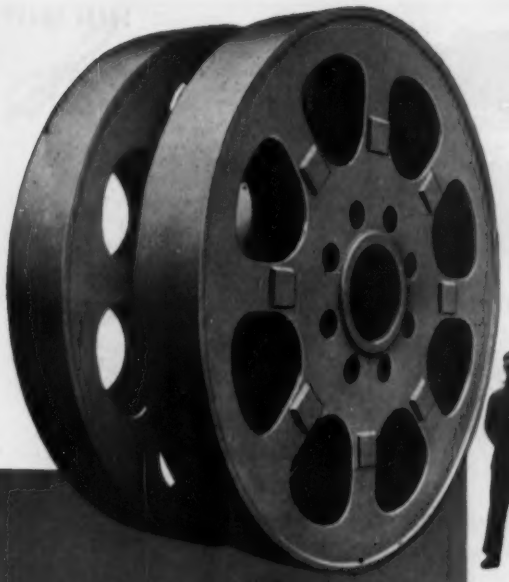
Gray Iron Founders' Society, Inc.
930 National City-E. 6th Bldg., Cleveland 14, Ohio
Exec. Vice-Pres.: D. H. Workman

Grinding Wheel Institute
2130 Keith Bldg., Cleveland 15, Ohio
Mgrs.: Hunter-Thomas Associates

Hack Saw Manufacturers Assn. of America
350 Madison Ave., New York 17, N. Y.
Secy.: Robert C. Bell, Jr.

Hardware Cloth and Poultry Netting Institute
74 Trinity Place, New York 6, N. Y.
Secy.: Ralph W. Bacon

Heat Exchange Institute
122 E. 42nd St., New York 17, N. Y.
Secy.: Frank P. Anderson



When you need
LARGE—HEAVY and ACCURATE
Weldments
call on
STRUTHERS WELLS

Twin Turbine Gear Wheel for Westinghouse Electric Corporation

Of heavy steel throughout with a hollow bored steel hub made in our own forge plant.

Column Bearing Plates for Loewy-Hydropress, Incorporated, N.Y.C.

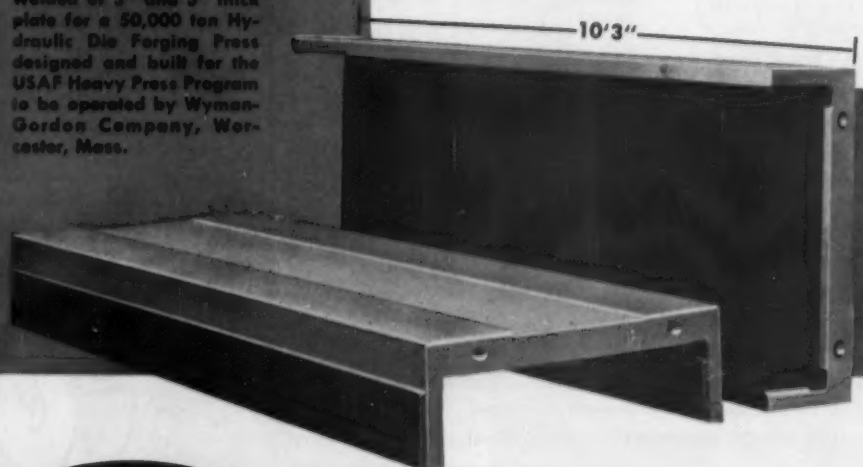
Welded of 3" and 5" thick plate for a 50,000 ton Hydraulic Die Forging Press designed and built for the USAF Heavy Press Program to be operated by Wyman-Gordon Company, Worcester, Mass.

The Gear Wheel and Bearing Plates illustrated typify Struthers Wells' manufacturing versatility.

The extensive facilities of three modern plants plus a century of experience are at your service.

We welcome the opportunity of furnishing either the complete assembly or any weldment part that is beyond your capacity.

Write for Weldments bulletin.



Pairs of these 8900 lb. bearing plates were supplied for the 50,000 ton Hydraulic Die Forging Press. Dimensions were 45" wide x 15" high x 10'3" long.

Struthers Wells

STRUTHERS WELLS CORPORATION
Titusville, Pennsylvania
Plants at Titusville, Pa. and Warren, Pa.

(Advertisement)

for better screw threads at lower costs per thousand pieces

on automatic screw machines,
turret lathes and other machines

CONSIDER THIS:

THE H & G Insert Chaser Automatic Die Head differs in design and construction from all other die heads. It is unique, without a counterpart, in a class by itself.

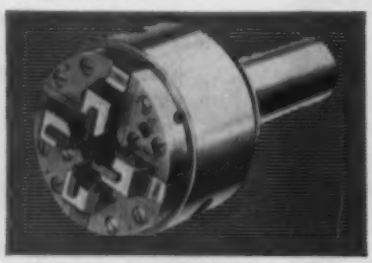
It employs small, low cost chasers as opposed to conventional and so-called long-life chasers. The latter, in the hands of a good mechanic, expert in grinding, give good results. But, cutting threads in this way can be compared to shaving with an old-fashioned, long-bladed, straight-edge razor; a good tool in the hands of a barber – *but not the average man.*

H & G Insert Chasers can be compared to low cost but highly efficient blades used in modern safety razors. They are so cheap that they can be thrown away when dull, or for utmost economy, can be sharpened again and again. With our new grinding fixture, anybody can do a beautiful job. Only a flash grind is required. Girl operators replace a dull set in two or three minutes without sending for a set-up man.

If threading to Class 3 specifications is troublesome, you would do well to change to H & G Insert Chaser Automatic Die Heads. They cut downtime to the minimum, keep machines humming and produce smooth, accurate threads.

Write about the possibility of a 30 day trial* giving the *make, size* and *model* of machine and the *thread size* and kind of *stock.* See what H & G Die Heads will do for you under your conditions.

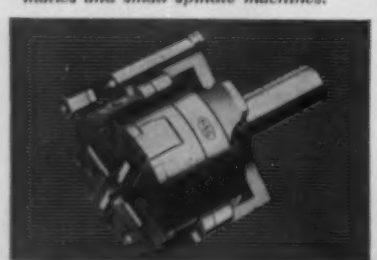
Ask for our bulletin entitled "SELECTING THE PROPER DIE HEAD FOR THE JOB".



ABOVE – *Style MM for multiple spindle automatics, chucking machines, drill presses.*

NOT SHOWN – *Style DMS for turret lathes.*

BELOW – *Style DM for B & S automatics and small spindle machines.*



*Standard size Die Head and subject to acceptable credit rating.

THE EASTERN MACHINE SCREW CORPORATION 21-41 Barclay Street New Haven

TRADE GROUPS

Heating and Cooling Coil Manufacturers' Assn.
2159 Guardian Bldg., Detroit 26, Mich.
Secy-Treas.: George W. McCormick, Jr.

Hollow Metal Door and Buck Assn.
501 Fifth Ave., New York 17, N. Y.
Exec. Secy.: Sidney O. Raphel

Hydraulic Institute
122 E. 42nd St., New York 17, N. Y.
Secy.: Frank P. Anderson

Industrial Diamond Assn. of America, Inc.
124 E. 40th St., New York 16, N. Y.
Exec. Mgr.: Athos D. Loveridge

Industrial Fasteners Institute
3648 Euclid Ave., Cleveland 15, Ohio
Secy.-Treas.: J. D. Eggers

Industrial Heating Equipment Assn., Inc.
412 Fifth St. N.W., Washington 1, D. C.
Exec. Vice-Pres.: C. L. Ipsen

Industrial Safety Equipment Assn.
366 Madison Ave., New York 17, N. Y.
Secy.: W. J. Parker

Industrial Truck Assn.
Washington Loan & Trust Bldg., Washington 4, D. C.
Managing Dir.: William Van C. Brandt

Industrial Unit Heater Assn.
2159 Guardian Bldg., Detroit 26, Mich.
Secy.-Treas.: George W. McCormick, Jr.

Industrial Wire Cloth Institute
74 Trinity Pl., New York 6, N. Y.
Secy.: Ralph W. Bacon

Insect Wire Screening Bureau
74 Trinity Pl., New York 6, N. Y.
Secy.: Ralph W. Bacon

Institute of Boiler and Radiator Manufacturers
608 Fifth Ave., New York 20, N. Y.
Gen. Mgr.: R. E. Ferry

Institute of Cooking and Heating Appliance Mfrs.
Shoreham Hotel, Washington 8, D. C.
Managing Dir.: Samuel Dunckel

Institute of Metals Div., AIME
29 W. 39th St., New York 18, N. Y.
Secy.: E. O. Kirkendall

Institute of Scrap Iron and Steel, Inc.
1729 H St., N. W. Washington 6, D. C.
Exec. Vice-Pres.: Edwin C. Barringer

Instrument Society of America
1319 Allegheny Ave., Pittsburgh 33, Pa.
Exec. Dir.: William H. Kushnick

Internal Combustion Engine Institute
201 N. Wells St., Chicago 6, Ill.
Exec. Secy.: Charles G. Spice

International Acetylene Assn.
30 E. 42nd St., New York 17, N. Y.
Secy.: H. F. Reinhard

International Tin Study Group
7 Carel van Bylandtlaan, The Hague, Netherlands
Secy.-Gen.: W. Fox

Iron & Steel Div., AIME
29 W. 39th St., New York 18, N. Y.
Secy.: E. O. Kirkendall

"Homer has a small metalworking shop in the basement."

Stonehouse **SIGNS** FOR INDUSTRIAL ACCIDENT PREVENTION

Safety on the March

Whatever your hazard, warning or guidance there's a Stonehouse sign to meet them. Shown in full color in our complete 64-page Catalog. It's sent free on request.

Stonehouse SIGNS, Inc. MANUFACTURERS • Stonehouse Bldg., 9th at Larimer Denver 4, Colorado

"Signs Since 1885"

ACCIDENT PREVENTION SIGNS IN STANDARD DESIGN AND COLOR

RICHARDS PYROMETER SUPPLIES

Control Temperatures More Closely
Reduce Cost—Save Time

Our Catalog shows you how! Get your free copy today!

• Thermocouples • Protection Tubes • Lead Wire
• Thermocouple Wire • Insulators • Pyrometers

Low prices for top quality—Prompt Shipment from stock

ARKLAY S. RICHARDS CO., INC.
62 Winchester Street NEWTON HIGHLANDS 61, MASS.

KEY SPECIALISTS

WOODRUFF FEATHER SPECIAL

Dept. T

30 years of customer satisfaction based on a superior product, reasonable pricing, delivery dependability, and company reliability.

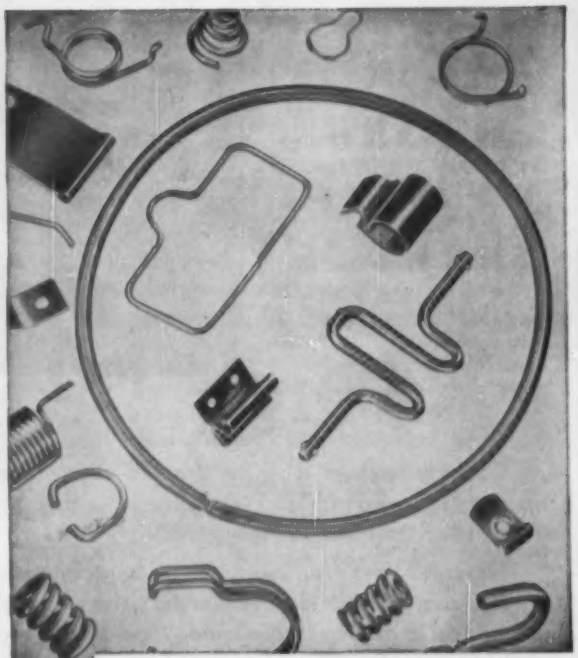
Always able to satisfy another customer.

Write for literature

GIB HEAD TAPERED

ALSO Special Shapes machined from cold drawn steel

STANDARD AUTOMOTIVE PARTS COMPANY
668 Nims Muskegon Michigan



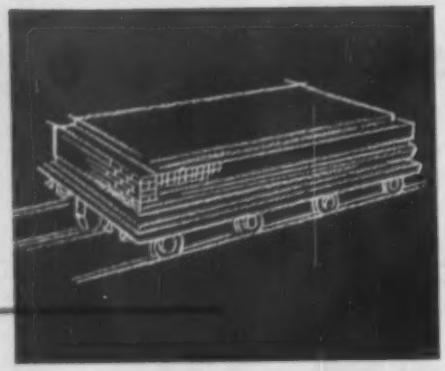
COIL SPRING SAYS:

No matter how intricate your spring designs or how precise your specs, U. S. Steel Wire Spring will produce them economically to meet your exact delivery date. And if you need engineering help, you can count on us—anytime. Perhaps this concentration on quality and service explains why more and more manufacturers turn to U. S. Steel Wire Spring when they have a spring order or a spring problem.

No order too large or too small!

The **U. S. STEEL WIRE SPRING** Co.
7800 FINNEY AVE. • MICHIGAN 1-6315
CLEVELAND 5, OHIO

HOLCROFT and the CAR-TYPE FURNACE



Car-type furnaces solve the problem of heat treating large, awkward-to-handle stock—or large quantities of parts which together form a bulky, heavy load.

Furnaces of this type can be either batch or continuous. In the first case, the load is rolled into the furnace and left there until the heat treat cycle is completed. When several cars are placed in line—the last one added pushing the row of cars through the furnace zones—the operation is continuous.

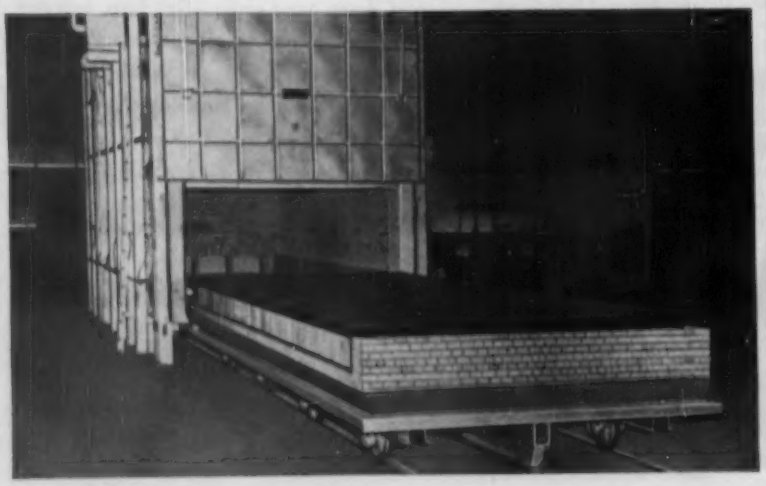
This is just one major classification of stock handling. Actually, there are several others—each to be considered when selecting a furnace to do a job. This is the type of flexibility you find when you turn your heat treat problems over to Holcroft. Only here do you get the personalized attention—the custom engineering—that slashes your costs and makes possible new standards in quality control.

Holcroft's new book "Blazing the Heat Treat Trail" is jam-packed with the various factors governing the selection of a heat treat furnace. But, see for yourself—write for your copy—today! Holcroft & Company, 6545 Epworth Blvd., Detroit 10, Mich.

HOLCROFT & COMPANY DETROIT — PRODUCTION HEAT TREAT FURNACES FOR EVERY PURPOSE

CHICAGO, ILL. CLEVELAND, OHIO HOUSTON, TEXAS PHILADELPHIA, PA.

CANADA: Walker Metal Products, Ltd., Windsor, Ontario EUROPE: S.O.F.I.M. Paris 8, France



TRADE GROUPS

The Lake Superior Iron Ore Assn.
1400 Hanna Bldg., Cleveland 15, Ohio
Pres.: Franklin G. Purdee

Lead Industries Assn.
420 Lexington Ave., New York 17, N. Y.
Secy.-Treas.: Robert L. Ziegfeld

Machine Knife Assn.
c/o The Wapakoneta Machine Co., Wapakoneta, Ohio
Pres.: M. M. Harrod

Machinery and Allied Products Institute
120 S. LaSalle St., Chicago 3, Ill.
Pres.: W. J. Kelly

Machinery Dealers National Assn.
1346 Connecticut Ave., Washington 6, D. C.
Exec. Dir.: R. K. Vinson

Machinery-Metals Export Club
330 W. 42nd St., New York 36, N. Y.
Secy. & Treas.: F. J. Muller

Machinists Vise Assn.
c/o Desmond Stephan Mfg. Co., Urbana, Ohio
Secy.: R. S. McConnell

Magnesium Assn.
122 E. 42nd St., New York 17, N. Y.
Asst. Secy.: (Miss) M. I. Hansen

Malleable Chain Manufacturers Institute
11 S. La Salle St., Chicago 3, Ill.
Exec. Secy.: Mark L. Patterson

Malleable Founders' Society
1800 Union Commerce Bldg., Cleveland 14, Ohio
Managing Dir.: Lowell D. Ryan

Manufacturers of Hard Edge, Flexible Back Metal Cutting Band Saws
350 Madison Ave., New York 17, N. Y.
Secy.: William P. Jeffery

Manufacturers Standardization Society of the Valve and Fittings Industry
420 Lexington Ave., New York 17, N. Y.
Exec. Secy.: Lester W. Benoit

Marking Device Assn.
912 Chicago Ave., Evanston, Ill.
Secy. & Gen. Mgr.: Elmer F. Way

Material Handling Institute, Inc.
813 Clark Bldg., Pittsburgh 22, Pa.
Managing Dir.: R. Kennedy Hanson

Metal Abrasive Council
Engineers Bldg., Cleveland 14, Ohio
Exec. Secy.: Arthur J. Tuscany

Metal Cutting Tool Institute
405 Lexington Ave., New York 17, N. Y.
Pres.: Mason Britton

Metal Lath Manufacturers Assn.
Engineers Bldg., Cleveland 14, Ohio
Managing Dir.: Donald R. Wadle

Metal Powder Assn.
420 Lexington Ave., New York 17, N. Y.
Secy.-Treas.: Robert L. Ziegfeld

"Fastest man we've got on piece work!"

NEW MORTON COMBINATION WELDING AND TRIMMING MACHINE

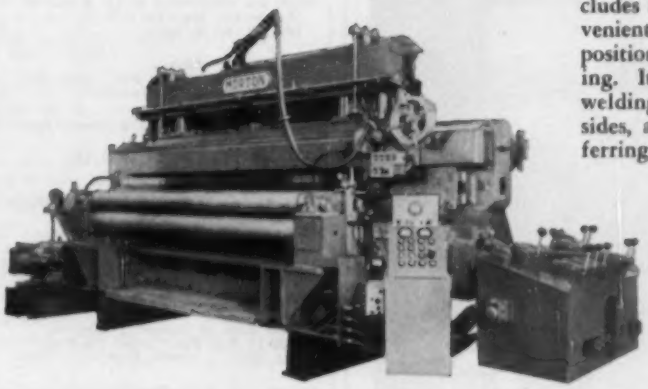


Fig. 4221. The Combined Welder and Trimmer includes all the essential features required for convenient handling of coil ends or flat sheets into position for submerged arc or gas shielded welding. It incorporates the time saving feature of welding and trimming the weld bead from both sides, at one time without unclamping or transferring the welded seam.

It is arranged for welding and trimming 10′ long seams in 1/16″ to 1/4″ stainless or other alloy sheets and strip. Pinch Rolls are furnished, the top roll being hydraulically-loaded for holding the sheet flat during welding and trimming operation. A water cooled copper back-up bar is supplied for welding operation. Any number of sheets of any width up to 10′ long can be efficiently joined to make one long sheet for your needs.

You can and will increase your Welding output with Morton Automatic Welding Machines as well as your Machine Production with Morton Machine Tools and Special Machinery.

Our New Bulletin 48-I shows plant views, lists our product and some of our machine tool facilities for producing superior Machine Tools and Automatic Welding Machines. Send for your copy today.

Morton Finished Machine Keys comprising Gib Head—Plain—Feather—Hi-Pro—Woodruff and Specials will assure lower assembly costs thru accuracies built into each key. A trial order will convince you.

MORTON MANUFACTURING COMPANY Muskegon Heights, Michigan

YOU CAN DO IT *BETTER – SAFER,* WITH DUCT-O-WIRE

DUCT - O - WIRE CONDUCTOR SYSTEMS are designed especially for crane and hoist applications. They give an easily installed, sure contact, trouble free method of electrifying this type of plant equipment and meet all National, State and local codes.

ONLY DUCT-O-WIRE GIVES YOU ALL THESE FEATURES

SIMPLIFIED DESIGN ★ COMPACT INSTALLATION ★ CONTINUOUS LENGTH SOLID COPPER CONDUCTOR WIRE ★ RIGID VINYL COVERING ★ LOWER MAINTENANCE COSTS HEAVY DUTY SERVICE ★ SAFER WORKING CONDITIONS ★ LOWEST COST

No other method of Electrifying Crane and Hoist installations offers so many outstanding advantages — **and at so low a price!**

If you are considering new equipment or modernizing an old installation — ***find out how you can do it better — cheaper,*** with DUCT-O-WIRE CONDUCTOR SYSTEMS.

ATTRACTIVE DISTRIBUTORSHIPS OPEN TO QUALIFIED REPRESENTATIVES

DUCT-O-WIRE CO.
P. O. BOX 28 — HUNTINGTON PARK, CALIFORNIA

DUCT-O-WIRE CO.
P. O. Box 28, Huntington Park, Calif.
Please send me illustrated literature on DUCT-O-WIRE CONDUCTOR SYSTEMS.

Name _____
Address _____
City _____ State _____

To be sure you're getting top quality lightweight castings, you'll want to look for:

- An experienced manufacturer
- A product made under close laboratory control and inspection
- Competent designers to work with your engineers
- A wide range of specifications and alloys
- Production economy

And you won't have to look far . . . just get in touch with WELLMAN. We'll be happy to help you with your castings problem.

Catalog No. 53 on request.

Well-Cast MAGNESIUM, ALUMINUM AND BRONZE CASTINGS

Well-Made WOOD AND METAL PATTERNS

THE WELLMAN BRONZE & ALUMINUM CO.

Dept. 8, 12800 Shaker Boulevard Cleveland 20, Ohio

Metal Treating Institute
271 North Ave., New Rochelle, N. Y.
Exec. Secy.: C. E. Herington

Mining and Metallurgical Society of America
11 Broadway, New York 4, N. Y.
Secy.: Donald M. Liddell

Mining Assn. of Montana
505 Montana Standard Bldg., Butte, Mont.
Secy.-Treas.: Carl J. Trauerman

Multiple V-Belt Drive and Mechanical Power Transmission Assn.
27 East Monroe St., Chicago 3, Ill.
Exec. Secy.: Harry P. Dolan

National Assn. of Architectural Metal Manufacturers
7209 Cedar Ave., Washington 12, D. C.
Secy.-Treas.: O. J. Condon

National Assn. of Corrosion Engineers
1061 M & M Bldg., Houston 2, Texas
Exec. Secy.: A. B. Campbell

National Assn. of Engineering Companies
1601-13 Dime Bldg., Detroit 26, Mich.
Exec. Secy.: A. Stewart Kerr

National Assn. of Fan Manufacturers, Inc.
2159 Guardian Bldg., Detroit 26, Mich.
Secy.-Treas.: George W.McCormick, Jr.

National Assn. of Manufacturers
14 W. 49th St., New York 20, N. Y.
Managing Dir.: Earl Bunting

National Assn. of Metal Finishers, Inc.
2117 LeRoy Place, N. W., Washington 8, D. C.
Exec. Secy.: Raymond M. Shock

National Assn. of Pipe Nipple Manufacturers, Inc.
501 Fifth Ave., New York 17, N. Y.
Secy.: H. A. Long, Jr.

National Assn. of Purchasing Agents
11 Park Place, New York 7, N. Y.
Exec. Secy.-Treas.: George A. Renard

National Assn. of Scale Manufacturers, Inc.
1 Thomas Circle, Washington 5, D. C.
Exec. -Secy.: Arthur Sanders

National Assn. of Sheet Metal Distributors
1900 Arch St., Philadelphia 3, Pa.
Exec. Secy.: Thomas A. Farnley, Jr.

National Assn. of Waste Material Dealers, Inc.
271 Madison Ave., New York 16, N. Y.
Exec. Vice-Pres.: Clinton M. White

National Electrical Manufacturers Assn.
155 E. 44th St., New York 17, N. Y.
Managing Dir.: W. J. Donald

"Afraid I can't make it. I've got a mountain of work on my desk."

TRADE GROUPS

National Foundry Assn.
53 W. Jackson Blvd., Chicago 4, Ill.
Exec. Secy.: Charles T. Sheehan

National Machine Tool Builders Assn.
2071 E. 102nd St., Cleveland, Ohio
Gen. Mgr.: Tell Berna

National Metal Spinners Assn.
186 Joralemon St., Brooklyn 2, N. Y.
Secy.: Max M. Goldhaber

National Metal Trades Assn.
122 S. Michigan Ave., Chicago 3, Ill.
Secy.: Chas. L. Blatchford

National Openhearth Committee, Iron & Steel Div., AIME
29 W. 39th St., New York 18, N. Y.
Secy.: E. O. Kirkendall

National Petroleum Assn.
Munsey Bldg., Room 958, Washington 4, D. C.
Gen. Counsel: Fayette B. Dow

National Screw Machine Products Assn.
2860 East 130th St., Cleveland 20, Ohio
Exec. Secy.: Orrin B. Wermtz

National Tool & Die Manufacturers Assn.
907 Public Square Bldg., Cleveland 13, Ohio
Exec. Secy.: George S. Eaton

National Truck Tank and Trailer Tank Institute
120 S. LaSalle St., Chicago 3, Ill.
Exec. Secy.: Allen R. Smith

National Warm Air Heating and Air Conditioning Assn.
145 Public Sq., Cleveland 14, Ohio
Managing Dir.: George Boeddener

National Warm Air Register Manufacturers Institute
5 E. Long St., Columbus 15, Ohio
Secy.-Treas.: Allen W. Williams

National Welding Supply Assn.
1900 Arch St., Philadelphia 3, Pa.
Secy.-Treas.: Robert C. Fernley

Non-Ferrous Founders' Society
192 N. Clark St., Chicago 1, Ill.
Exec. Secy.: James W. Wolfe

Office Equipment Manufacturers Institute
777 Fourteenth St., N. W., Washington, D. C.
Administrative Vice-Pres.: E. D. Taylor

Open Steel Flooring Institute, Inc.
1506 First National Bank Bldg., Pittsburgh 22, Pa.
Secy.-Treas.: Stuart J. Swensson

"Nobody pampered me when I started here. I pampered myself."

PEARLITIC MALLEABLE CASTINGS

when operating conditions . . .

. . . are severe

If service conditions are unusually rugged and you're troubled by high manufacturing costs—look to pearlitic malleable castings!

Pearlitic malleable has high fluidity that casts easily into complicated shapes. It resists wear under heavy loads at high speeds . . . has high ultimate strength . . . possesses excellent non-seizing properties for bearing surfaces . . . can be given a very smooth finish where desired . . . and can be either liquid quenched or air quenched. And perhaps *most important of all, pearlitic malleable machinability index ranges from 80 to 90* (B1112 steel = 100).

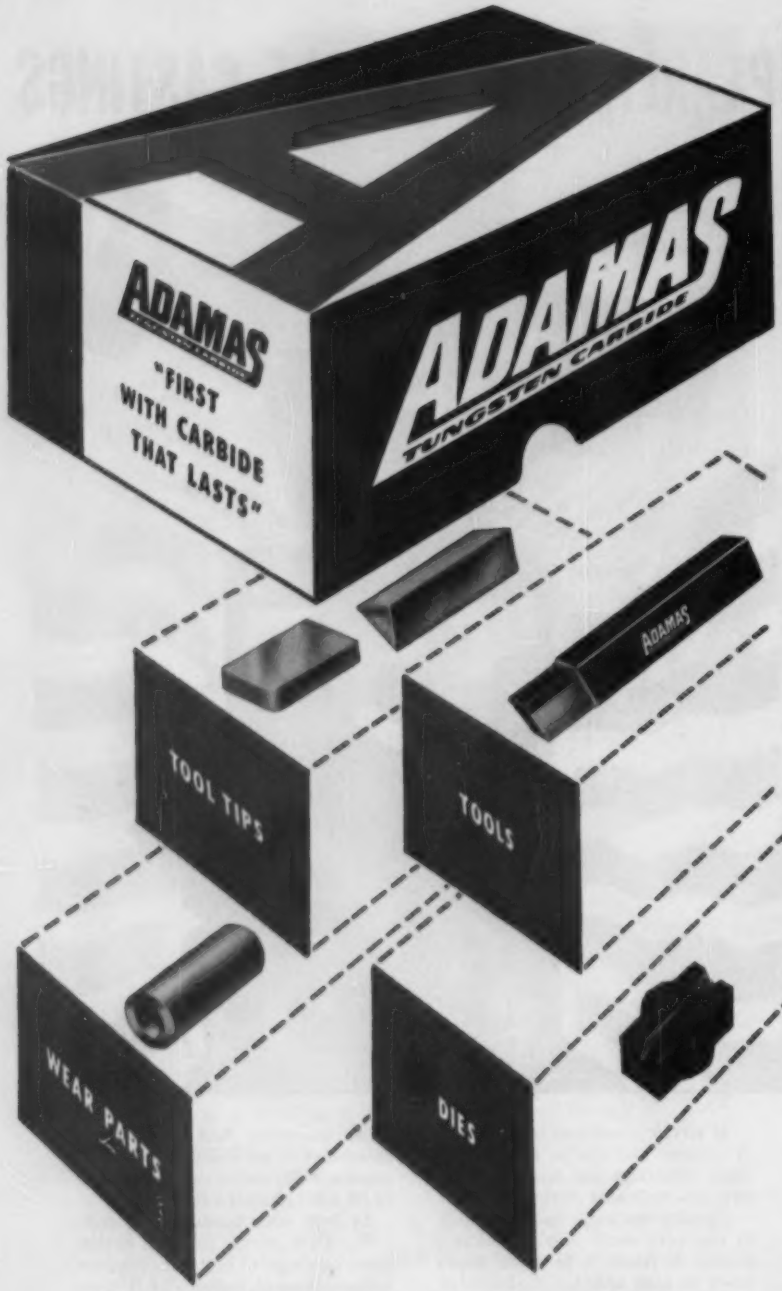
So look your product over critically. Then check pearlitic malleable castings. They can replace more expensive methods of fabrication or manufacture . . . can lead to reduced weight, less machining time . . . fewer assembly operations . . . *greater sales appeal for your product.* AA-168

NATIONAL MALLEABLE AND STEEL CASTINGS

M&S EST. 1900

COMPANY
Cleveland 6, Ohio

The Nation's largest independent producer of malleable and pearlitic malleable



You'll find your tungsten carbide needs, whatever they are, best served under the big "A". It's the quickly-identified sign of the finest in carbide performance and service . . . adopted as standard today by leading metal working plants. It will pay you to know ADAMAS better, too . . . place your next order with ADAMAS and be convinced.

ADAMAS
TUNGSTEN CARBIDE

ADAMAS CARBIDE CORPORATION · KENILWORTH, NEW JERSEY

TRADE GROUPS

Pipe Fittings Manufacturers Assn.
60 E. 42nd St., New York 17, N. Y.
Secy.-Treas.: J. L. Giacomino

Porcelain Enamel Institute, Inc.
Dupont Circle Bldg., 1346 Connecticut Ave., N.W.
Washington 6, D. C.
Pres.: William N. Brinker

Power Crane and Shovel Assn.
74 Trinity Pl., New York 6, N. Y.
Secy.: Herbert S. Blake, Jr.

Power Fan Manufacturers' Assn.
2159 Guardian Bldg., Detroit 26, Mich.
Secy.-Treas.: George W. McCormick, Jr.

Power Transmission Council, Inc.
320 Broadway, New York 7, N. Y.
Vice-Pres.: E. R. Rath

Pressed Metal Institute
2860 East 130th St., Cleveland 20, Ohio
Managing Dir.: Orrin B. Werntz

Radio-Electronics-Television Manufacturers Assn.
Wyatt Bldg., Suite 800
777 Fourteenth St., N. W., Washington 5, D. C.
Exec. Vice-Pres.: James D. Secrest

Rail Steel Bar Assn.
38 S. Dearborn St., Chicago 3, Ill.
Pres.: O. W. Irwin

Resistance Welder Manufacturers Assn.
1900 Arch St., Philadelphia 3, Pa.
Exec. Secy.: George A. Fernley

Roll Manufacturers Institute
1026 Farmers Bank Bldg., Pittsburgh 22, Pa.
Exec. Secy. & Treas.: M. K. Ulrich

Rolling Mill Machinery and Equipment Assn.
1026 Farmers Bank Bldg., Pittsburgh 22, Pa.
Secy.-Treas.: M. K. Ulrich

Scientific Apparatus Makers Assn.
20 N. Wacker Drive (Rm. 3120), Chicago 6, Ill.
Dir. Public Information: James E. Irving

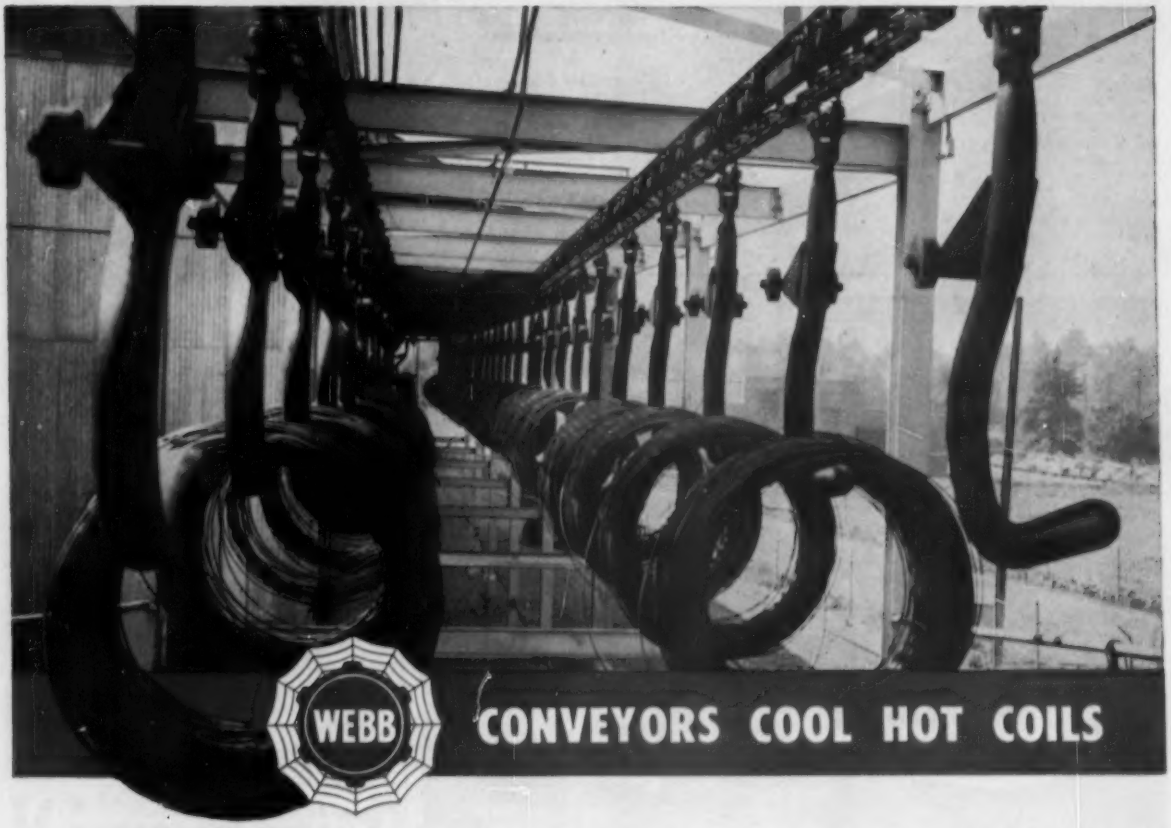
Service Tools Institute
53 Park Place, New York 7, N. Y.
Secy.: George P. Byrne

Shipbuilders Council of America
21 West St., New York 6, N. Y.
Secy.-Treas: C. C. Knorr

"I'll tell you who'd make a good boss, I'd make a good boss. That's who'd make a good boss."

JERVIS B. WEBB

CONVEYOR ENGINEERING, MANUFACTURE, INSTALLATION and AUTOMATION



Here's how an Indiana steel mill utilized Webb engineering, manufacturing and installation experience to secure an automatic conveyor system that handles hot rod coils all the way from reels to storage and shipping without a hand touching them.

Starting at the laying and pouring reels, the 630 pound coils of hot steel are automatically placed on a high speed (240 F.P.M.) slat conveyor by means of an electrically powered rack and pinion pusher. When a coil reaches the end of the slat conveyor, another pusher transfers it onto the drag conveyor where automatic water quenching takes place. Because the drag conveyor travels at an average speed of 18 F.P.M. and has dogs located on six foot centers, it was necessary to install electrical interlocks that permit the pusher to operate only when there is clearance for the coil.

Transfer of coils from drag to trolley conveyor is also automatic—a cam actuated bobber at the end of the drag conveyor is properly co-ordinated to tilt each coil so hooks on trolley conveyor can enter the coil and lift it. The overhead trolley conveyor is approximately 1400 feet long and handles these heavy coils at an average rate of one every 20 seconds.

An automatic unloader at the end of the trolley conveyor is an excellent example of Webb automation. This unit consists of a vertical shaft and six rotating horizontal arms. Each arm receives a predetermined number of coils from the trolley conveyor before automatically indexing the next arm to the unloading position. Coils are removed from arms by either crane hooks or ram type tractor for delivery to storage or an adjoining building for further processing.

Write to us on your company letterhead and we will be happy to place your name on the Webb mailing list to receive factual technical information on conveyor installations, case history reports, and new product literature.

JERVIS B. WEBB CO.

Specialists in Custom Conveyor Systems

8931 ALPINE AVENUE • DETROIT 4, MICHIGAN

4150

Offices and Representatives Throughout The World • FACTORIES: *Detroit* • *Los Angeles* • *Hamilton, Ontario*

Society for Non-Destructive Testing
1109 Hinman St., Evanston, Ill.
National-Secy.: Philip D. Johnson

Society of Automotive Engineers
29 W. 39th St., New York 18, N. Y.
Secy. & Gen. Mgr.: John A. C. Warner

Society of Plastic Engineers, Inc.
513 Security Bank Bldg., Athens, Ohio
Exec. Secy.: P. J. Underwood

Sockets Screw Products Bureau
53 Park Pl., New York 7, N. Y.
Secy.: George P. Byrne

Spring Manufacturers Assn.
249 Main St., Bristol, Conn.
Secy.: George E. Underwood

Spring Washer Institute
74 Trinity Place, New York 6, N. Y.
Secy.: Herbert S. Blake, *Jr.*

Steel Boiler Institute, Inc.
1308 Land Title Bldg., Philadelphia 10, Pa.
Pres.: R. A. Locke

Steel Castings Institute of Canada
568 Booth St., Ottawa, Canada

Steel Founders' Society of America
920 Midland Bldg., Cleveland 15, Ohio
Exec. Vice-Pres.: F. Kermit Donaldson

Steel Joist Institute
Dupont Circle Bldg., 1346 Connecticut Ave., N.W.
Washington 6, D. C.
Managing Dir.: C. H. Lunderman

Steel Kitchen Cabinet Manufacturers Assn.
1008 Engineers Bldg., Cleveland 14, Ohio
Exec. Secy.: Arthur J. Tuscany, Jr.

Steel Plate Fabricators Assn.
79 W. Monroe St., Chicago 3, Ill.
Exec. Dir.: J. Dwight Evans

Steel Products Warehouse Assn.
637 Union Commerce Bldg., Cleveland 14, Ohio
Pres.: Clayton Grandy

Steel Shipping Container Institute, Inc.
600 Fifth Ave., New York 20, N. Y.
Pres.: Livingston Keplinger

Steel Tank Institute
120 S. LaSalle St., Chicago 3, Ill.
Exec. Secy.: Allan R. Smith

Steel Window Institute
806 Rowland Rd., Cheltenham, Pa.
Exec. Secy.: George Hingston

Tin Research Institute, Inc.
492 W. 6th Ave., Columbus 1, Ohio
Supvr., Met. Res. & Dev.: Robert J. Nekervis
Supvr. Chem. Res. & Dir.: R. M. MacIntosh

Tri-State Zinc and Lead Ore Producers Assn.
P. O. Box 879, Miami, Okla.
Secy.: C. E. Stover

Truck Body and Equipment Assn., Inc.
1616 K St., N.W., Washington 6, D. C.
Exec. Mgr.: Arthur H. Nuesse

Truck Trailer Manufacturers Assn.
Room 710 Albee Bldg., Washington 5, D. C.
Managing Dir.: John B. Hulse

Tubular and Split Rivet Council
53 Park Pl., New York 7, N. Y.
Commissioner: George P. Byrne

United States Copper Assn.
50 Broadway, New York 4, N. Y.
Secy.: R. N. Eckert

United States Machine Screw Service Bureau
53 Park Pl., New York 7, N. Y.
Managing Dir.: George P. Byrne

Uranium Industry Assn.
553 Washington Bldg., Washington 5, D. C.
Pres.: Maurice B. Mumford

Utah Mining Assn.
918 Kearns Bldg., Salt Lake City 1, Utah
Mgr.: Miles P. Romney

Valve Manufacturers Assn.
60 E. 42nd St., New York 17, N. Y.
Secy.-Treas.: George A. Cooper

Wire Assn.
453 Main St., Stamford, Conn.
Exec. Secy.: Richard E. Brown

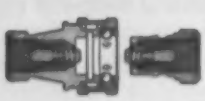
Wire Reinforcement Institute
National Press Bldg., Washington 4, D. C.
Managing Dir.: Franklin B. Brown

HANSEN

QUICK-CONNECTIVE
2-WAY
SHUT-OFF
COUPLINGS!

QUICK CONNECTION AND DISCONNECTION

INSTANT AUTOMATIC FLOW OR SHUT-OFF



Seals Both Ends of Line
AUTOMATICALLY INSTANTANEOUSLY

To connect a Hansen Two-Way Shut-Off Coupling, you just pull back the sleeve and push the Plug into the Socket. To disconnect, merely pull back sleeve. No tools required. Similar valves in Socket and Plug shut off both ends of line when Coupling is disconnected—practically eliminate spilling of liquid or escape of gas at instant of disconnection.

Quick Connective Fluid Line Couplings for
AIR • OIL • GREASE • HYDRAULIC FLUIDS • REFRIGERANTS • STEAM VACUUM • OXYGEN • ACETYLENE GASOLINE • COOLANTS • WATER

HOSE CLAMPS • HOSE CLAMP PLUGS • HOSE CLAMP SOCKETS HOSE CLAMP COUPLINGS • AIR LIQUID SPRAY GUNS • AIR BLOW GUNS • SAND BLAST CLEANERS ENGINE CLEANERS

FEMALE PIPE THREAD CONNECTIONS FROM ⅛" TO 1"

Hansen Series HK Two-Way Shut-Off Couplings are available with female pipe thread connections from ⅛" to 1" inclusive. Available in brass or steel.

Also Straight-Through and One-Way Shut-Off Couplings. Write for Catalog.

REPRESENTATIVES IN PRINCIPAL CITIES

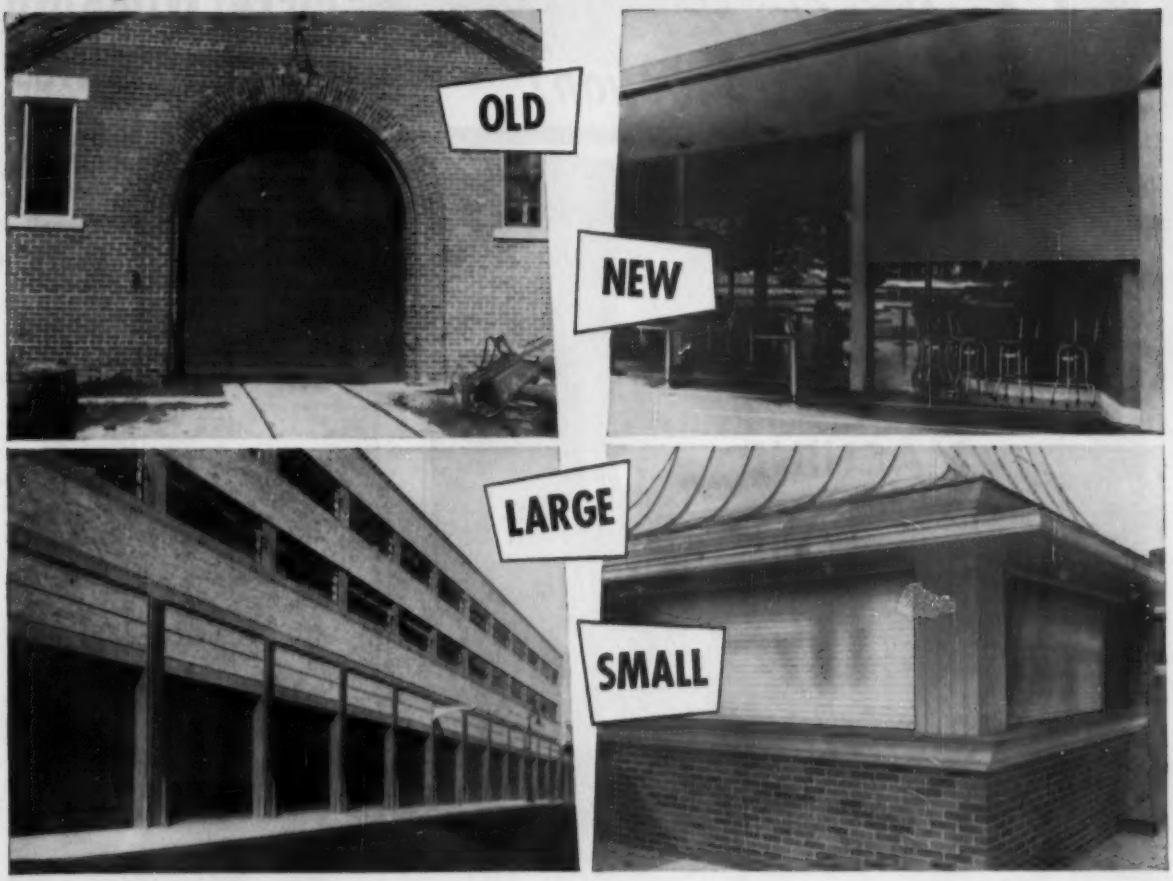
SINCE 1915 — QUICK-CONNECTIVE FLUID LINE COUPLINGS

THE HANSEN MANUFACTURING COMPANY

4031 WEST 150th STREET • CLEVELAND 11, OHIO

"All you have to do is say 'No' . . . But don't tell me how to run my business."

For Highest Doorway Efficiency — whether your building is . . .



Kinnear Steel Rolling Doors

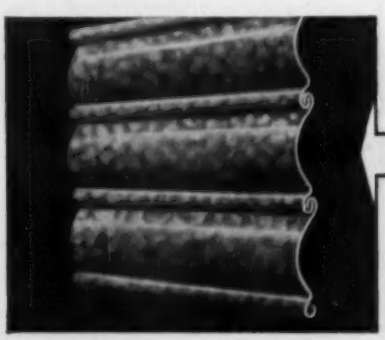
Every Kinnear Rolling Door is "custom tailored" to fit a specific need. The type of opening . . . its size . . . jamb and lintel details . . . the kind of traffic through it . . . where the door will be operated from—all these factors and many more are studied with care by Kinnear engineers. That's why you're *sure* to get maximum efficiency from the *coiling upward action* of Kinnear Rolling Doors.

Kinnear's rugged interlocking-slat curtain opens straight upward . . . coils out of the way above the opening . . . stays out of reach of damage by wind or vehicles when opened . . . leaves all surrounding floor, wall and ceiling space clear and usable at all times.

You can stack materials within an inch or two of the Kinnear Door curtain—*inside or outside the opening*—without blocking the door's smooth, easy action. Hoist, crane, or conveyor equipment can be operated right up close to the face of the door. *No usable space is ever wasted with Kinnear Rolling Doors.*

Kinnear Motor Operators give you the extra speed and efficiency of push-button door control—plus remote control switches if desired. Each door can be made to operate from more than one switch, or any number of doors can be controlled from a single point.

Yes, Kinnear Rolling Doors are made *any* size, for easy installation in any building, old or new. Write today for complete information.



HEAVILY GALVANIZED

Heavy galvanizing (1.25 oz. pure zinc per square foot, ASTM standards) assures high resistance to corrosion. Special Kinnear Paint Bond assures thorough paint coverage and lasting paint adhesion.

The KINNEAR Mfg. Co.

FACTORIES:
1760-80 Fields Ave., Columbus, Ohio
1742 Yosemite Avenue, San Francisco 24, Calif.
Offices and Agents in All Principal Cities

Saving Ways in Doorways
KINNEAR
ROLLING DOORS

Another Cleveland Design to Speed Production!

CLEVELAND NUT TAPPING MACHINE

OPERATION: Core drill and tap cast iron nuts ⅝" through 1 ½"

Produces 1020—⅞"—9 Pitch Cast Iron Nuts per hour @ 100% Efficiency

DESCRIPTION: A vertical F-2 type Cleveland Heavy Duty Machine with eight spindle multiple head and a double slide four track feeder. The feeder fixture has a double slide mounted on hardened and ground slide bars to slide back approximately 3 ½" picking up a new part at end of each four tracks and at the same time picking up the drilled part at the drill position; then to slide forward to a fixed position and hold the parts at drill and tap position; at the same time the finished parts will be discharged onto a delivery chute at the rear of the tap spindles. The operator loads the nuts from a large tray in front of machine into magazine.

Send for your copy of this Guide

Write today for Catalog No. IA-15

CLEVELAND tapping machine co.

A Subsidiary of AUTOMATIC STEEL PRODUCTS, INC. • CANTON 6, OHIO

METALWORKING MEETINGS FOR 1955

Technical Meetings, Conventions and Expositions on Various Phases of Metalworking and Metal Production.

(For January meetings, see page 13)

FEBRUARY

AMERICAN INSTITUTE OF MINING & METALLURGICAL ENGINEERS — Annual meeting, Feb. 14-17, Conrad Hilton Hotel, Chicago. Institute headquarters are at 29 W. 39th St., New York.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS — Founding Anniversary meeting, Feb. 16, New York. Society headquarters are at 29 W. 39th St., New York.

DROP FORGING ASSN.—Winter Industry Meeting, Feb. 17-18, Statler Hotel, New York. Association headquarters are at 605 Hanna Bldg., Cleveland.

AMERICAN SUPPLY & MACHINERY MANUFACTURERS ASSN., INC.—Regional meeting, Feb. 28-Mar. 1, Philadelphia. Association headquarters are at 2130 Keith Bldg., Cleveland.

MARCH

NATIONAL ASSN. OF CORROSION ENGINEERS—Annual meeting and Show, Mar. 7-11, Palmer House, Chicago. Association headquarters are at 1061 M & M Bldg., Houston.

PORCELAIN ENAMEL INSTITUTE — Pacific Coast conference, Mar. 10-11, Biltmore Hotel, Los Angeles. Institute headquarters are at Dupont Circle Bldg., 1346 Connecticut Ave., N. W., Washington, D. C.

AMERICAN SOCIETY OF TOOL ENGINEERS—Annual meeting, Mar. 14-18, Shrine Auditorium and Exposition Hall, Los Angeles. Society headquarters are at 10700 Puritan Ave., Detroit.

STEEL FOUNDERS' SOCIETY OF AMERICA—Annual meeting, Mar. 15-16, Drake Hotel, Chicago. Society headquarters are at 920 Midland Bldg., Cleveland.

NATIONAL ASSN. OF WASTE MATERIAL DEALERS, INC.—Annual convention, Mar. 20-22, The Conrad Hilton Hotel, Chicago. Association headquarters are at 271 Madison Ave., New York.

INTERNATIONAL ACETYLENE ASSN. —Annual spring convention, Mar. 22-24, Shamrock Hotel, Houston. Association headquarters are at 30 E. 42nd St., New York.

AMERICAN MACHINE TOOL DISTRIBUTORS ASSN.—Spring meeting, Mar. 25-26, The Greenbrier, White Sulphur Springs, West Va. Association headquarters are at 1900 Arch St., Philadelphia.

AMERICAN SOCIETY FOR METALS—Western Metal Exposition and Congress, Mar. 28-Apr. 1, Pan Pacific Auditorium, Los Angeles. Society headquarters are at 7301 Euclid Ave., Cleveland.

STEEL SHIPPING CONTAINER INSTITUTE, INC. — Annual meeting, Mar. 29-31, Biltmore Hotel, Palm Beach, Fla. Institute headquarters are at 600 Fifth Ave., New York.

WAREHOUSE STOCK

They RETURN and RETURN and RETURN to WARD for SPRING STEEL

•

TEMPERED and UNTEMPERED SPRING STEEL with WARD is not an added side-line to reduce overhead, rather it is a major commodity requiring a separate organization with personnel having seven to over thirty years experience on SPRING STEEL exclusively. This means you can be sure of INTELLIGENT SERVICE.

We carry more sizes of BLUE TEMPERED SPRING STEEL than any other warehouse and we ship promptly.

We do not stock HOT ROLLED SPRING STEEL BARS or HOT ROLLED SPRING STEEL SHEETS.

•

WARD STEEL CO.

87B Rindge Avenue Extension • Cambridge 40, Mass.

Telephone:—SOuth Boston 8-1264

Branches

7 Fenner St., Providence, R. I., GAspee 1-5573, 1-8573
3042-3058 West 51st Street, Chicago, Illinois, GRovehill 6-2600

Sales Agent: THE MILLER STEEL COMPANY, INC.
40-50A Montgomery Street, Hillside 5, New Jersey
Hillside Phone: WAverly 6-6000—New York Phone: BArclay 7-2056

NOW! GRAND RAPIDS UNIVERSAL CUTTER AND TOOL GRINDERS

are on improved delivery schedules

It's true, they have been hard to get because every model offers extra value.

The Model 62, for instance, features four-speed spindle drive, universal positioning of elevating hand wheel, anti-friction ways, more vertical capacity, longer swing, one-shot lubrication system.

The many other Grand Rapids Cutter Grinders are also on improved delivery schedules. Send coupon for complete information.

• *GET THE FULL STORY ON ALL THE ADVANTAGES*

GALLMEYER & LIVINGSTON

GALLMEYER & LIVINGSTON CO.
400 Straight Ave., Grand Rapids, Mich.
Please send me the following literature without obligation:

☐ Cutter and Grinder Literature
☐ Surface Grinder Literature

NAME _____
POSITION _____
FIRM _____
FIRM ADDRESS _____

We'll answer within twenty-four hours

APRIL

AMERICAN HARDWARE MANUFACTURERS ASSN.—Spring meeting, Apr. 10-14, Palm Beach, Fla. Association headquarters are at 342 Madison Ave., New York.

CONCRETE REINFORCING STEEL INSTITUTE—Annual meeting, Apr. 11-16, The Greenbrier Hotel, White Sulphur Springs, West Va. Institute headquarters are at 38 S. Dearborn St., Chicago.

AMERICAN SOCIETY OF LUBRICATION ENGINEERS — Annual meeting and Exhibit, Apr. 13-15, Sherman Hotel, Chicago. Society headquarters are at 84 E. Randolph St., Chicago.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS — Organization anniversary meeting, Apr. 16, Hoboken, N. J. Society headquarters are at 29 W. 39th St., New York.

PACKAGING MACHINERY MANUFACTURERS INSTITUTE — Semi-annual meeting, Apr. 16-17, Palmer House, Chicago. Institute headquarters are at 342 Madison Ave., New York.

SCIENTIFIC APPARATUS MAKERS ASSN. — Annual meeting, Apr. 17-21, The Greenbrier, White Sulphur Springs, West Va. Association headquarters are at 20 N. Wacker Drive, Chicago.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS—Diamond Jubilee spring meeting, Apr. 18-22, Lord Baltimore and Southern Hotels, Baltimore. Society headquarters are at 29 W. 39th St., New York.

ASSN. OF IRON & STEEL ENGINEERS —Spring conference, Apr. 25-27, Statler Hotel, Detroit. Association headquarters are at 1010 Empire Bldg., Pittsburgh.

ASSN. OF CONSULTING CHEMISTS & CHEMICAL ENGINEERS — Semi-annual meeting, Apr. 26,T. Association headquarters are at 50 E. 41st St., New York.

GRINDING WHEEL INSTITUTE — Spring meeting, Apr. 27-29, The Homestead, Hot Springs, Va. Institute headquarters are at 2130 Keith Bldg., Cleveland.

RAIL STEEL BAR ASSN.—Annual meeting, Apr. 27-29, Grand Hotel, Point Clear, Ala. Association headquarters are at 38 S. Dearborn St., Chicago.

AMERICAN ZINC INSTITUTE, INC. — Annual meeting, Apr. 28-29, Drake Hotel, Chicago. Institute headquarters are at 60 E. 42nd St., New York.

LEAD INDUSTRIES ASSN. — Annual meeting, Apr. 28-30, Drake Hotel, Chicago. Association headquarters are at 420 Lexington Ave., New York.

MAY

THE ELECTROCHEMICAL SOCIETY, INC.—Annual spring meeting, May 2-5, Sheraton-Gibson Hotel, Cincinnati. Society headquarters are at 216 W. 102nd St., New York.

STEEL BOILER INSTITUTE, INC.—Annual meeting, May 9-10, The Shamrock Hotel, Houston. Institute headquarters are at 1303 Land Title Bldg., Philadelphia.

METAL POWDER ASSN.—Annual meeting, May 10-12, Bellevue-Stratford Hotel, Philadelphia. Association headquarters are at 420 Lexington Ave., New York.

NATIONAL ASSN. OF SHEET METAL DISTRIBUTORS—Spring meeting, May 12-13, Cleveland Hotel, Cleveland. Association headquarters are at 1900 Arch St., Philadelphia.

AMERICAN SOCIETY OF TOOL ENGINEERS—Annual meeting, May 14-18, Shrine Auditorium and Exposition Hall, Los Angeles. Society headquarters are at 10700 Puritan Ave., Detroit.

INDUSTRIAL HEATING EQUIPMENT ASSN., INC.—Spring meeting, May 15-18, The Homestead, Hot Springs, Va. Association headquarters are at 412 Fifth St., N. W., Washington, D. C.

NATIONAL MATERIALS HANDLING EXPOSITION—May 16-20, Chicago. Management: Clapp & Poliak, Inc., 341 Madison Ave., New York.

PORCELAIN ENAMEL INSTITUTE—Mid-Year Division conference, May 18-20, Edgewater Beach Hotel, Chicago. Institute headquarters are at Dupont Circle Bldg., 1346 Connecticut Ave., N.W., Washington, D. C.

MACHINERY DEALERS NATIONAL ASSN.—Convention, May 23-25, Netherland Plaza Hotel, Cincinnati. Association headquarters are at 1346 Connecticut Ave., N.W., Washington, D. C.

THERE'S A **JOHNSON** BEARING FOR EACH USE

The great majority of bearing applications are suited to sleeve bearings. There are uncounted uses for them in all types of mechanical equipment. So, Johnson Bronze produces a great variety of sleeve bearings for these multitudinous applications. You will find industry's widest range in the Johnson line . . . various alloys, bronze, babbitt and aluminum, and different combinations with bronze and steel. The sizes range from tiniest bearings up to King Size, 14" OD and 17" long. They are economical in first cost and in operation, and in most cases will give service for the life of the equipment in which they are installed. Since Johnson produces all types of sleeve bearings, their engineers can give you unbiased advice on the bearing best suited to your application.

JOHNSON BRONZE COMPANY
505 South Mill Street • New Castle, Pa.

JOHNSON BEARINGS
Sleeve-Type

Write for information

...for the best solution to your bearing problem

For quick replacement wherever and whenever a finished, ready-for-assembly highest quality bronze bearing is required, simply phone your local Bunting Distributor. Even extra ordinary requirements can be met from the vast assortment of finished Bunting bronze bearings in his comprehensive stocks.

SAVES YOU MONEY

Your Bunting Distributor carries in stock for your money saving convenience completely machined and finished Bunting Standard Stock Industrial Bearings, Electric Motor Bearings and Precision Bronze Bars in a complete range of sizes, meeting all your usual production and maintenance needs. You will find him listed in the classified section of your telephone book—most likely under the heading Bars, Bronze or Bearings, Bronze. Your Bunting Distributor is an industrial distributor or a specialist in certain industrial items. He has been especially selected for his responsibility and his understanding of bearing requirements. Ask him for the Bunting Catalog or write.

Bunting

THE BUNTING BRASS & BRONZE COMPANY, TOLEDO 1, OHIO
BRANCHES IN PRINCIPAL CITIES

MEETINGS

AMERICAN IRON AND STEEL INSTITUTE—General meeting, May 25-26. Institute headquarters are at 350 Fifth Ave., New York.

NATIONAL ASSN. OF PURCHASING AGENTS—Annual convention and Inform-A-Show, May 29-June 1, Waldorf-Astoria Hotel, New York. Association headquarters are at 11 Park Place, New York.

BASIC MATERIALS EXPOSITION—May 31-June 3, Convention Hall, Philadelphia. Show management: Clapp & Poliak, Inc., New York.

JUNE

AMERICAN GEAR MANUFACTURERS ASSN.—Annual meeting, June 5-8, The Homestead, Hot Springs, Va. Association headquarters are at One Thomas Circle, Washington, D. C.

AMERICAN WELDING SOCIETY, INC.—Spring meeting, June 7-10, Kansas City. Society headquarters are at 33 W. 39th St., New York.

SOCIETY OF AUTOMOTIVE ENGINEERS—Golden Anniversary Summer meeting, June 12-17, Chalfonte-Haddon Hall, Atlantic City, N. J. Society headquarters are at 29 W. 39th St., New York.

EDISON ELECTRIC INSTITUTE—Annual meeting, June 13-16, Los Angeles. Institute headquarters are at 420 Lexington Ave., New York.

RADIO - ELECTRONICS - TELEVISION MANUFACTURERS ASSN. — Annual convention, June 14-16, Palmer House, Chicago. Association headquarters are at 777 Fourteenth St., N.W., Washington, D. C.

MALLEABLE FOUNDERS' SOCIETY—Annual meeting, June 16-18, The Greenbrier Hotel, White Sulphur Springs, W. Va. Society headquarters are at Union Commerce Bldg., Cleveland.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS—Diamond Jubilee semiannual meeting, June 19-23, Statler Hotel, Boston. Society headquarters are at 29 W. 39th St., New York.

AMERICAN ELECTROPLATERS' SOCIETY—Annual convention, June 20-23. Industrial Finishing Exposition, Municipal Auditorium, Cleveland. Society headquarters are at 445 Broad St., Newark, N. J.

ALLOY CASTING INSTITUTE—Annual meeting, June 26-28, Hot Springs, Va. Institute headquarters are at 32 Third Ave., Mineola, New York.

AMERICAN SOCIETY FOR TESTING MATERIALS—Annual meeting, June 26-June 1. Chalfonte-Haddon Hall Hotel, Atlantic City, N. J. Society headquarters are at 1916 Race St., Philadelphia.

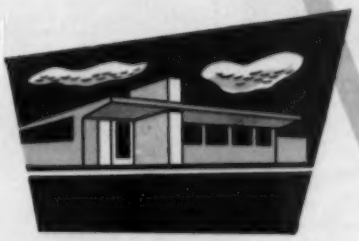
"We're very proud of our clean little foundry."

MUELLER BRASS CO.

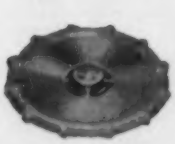
FORGINGS

ARE MADE TO LAST!

QUALITY PARTS AND PRODUCTS FORGED AND MACHINED OF BRASS, BRONZE AND ALUMINUM OR MAGNESIUM



IN THE HOME



IMPELLER DISPOSER

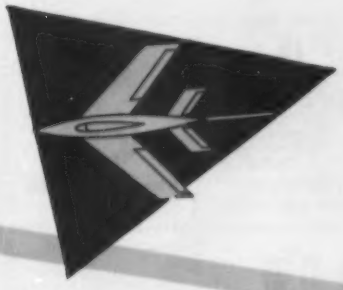
One of four Mueller Brass Co. parts in modern waste disposal unit. Completely dependable in daily operation.

WINDOW HARDWARE

Forged of natural bronze. Can be furnished in aluminum or chrome finish as desired. Retains original beauty indefinitely.

BURNER HEAD

Forged of aluminum for installation in gas stove. Lightweight yet strong.



IN AVIATION

LANDING GEAR TORQUE ARM SUPPORT MEMBER

These, aluminum forgings provide the same strength as steel yet weigh only 1/3 as much. Smooth bright surfaces save machining time and eliminate costly finishing.

INSTRUMENT HOUSING

Specially designed forged housing for sealing diaphragm in aviation pressure warning unit.

IN INDUSTRY

CONNECTING ROD

Forged from "600" series metal. Over two million connecting rods produced without recorded failure.

ACTUATING GEAR

Forged from special Mueller Brass Co. alloy. Must take constant pounding.

AUTOMOTIVE GEAR

Forged of "600" series metal for use in automotive automatic transmission. Replaced part that was giving constant trouble; solved costly problem.

All Mueller Brass Co. forgings, of which just a few are shown here, have a dense, close-grained structure with a high tensile strength. Weight savings up to 40% are possible in the design of parts because of the close tolerances to which they can be produced. Less scrap and longer tool life result from the easy machinability of forged parts. Mueller Brass Co. is completely equipped to design parts for your products, specify alloys (including special alloys developed by our metallurgists), forge, machine, finish and plate the parts and perform all necessary assembly operations. Write today for our free illustrated 32-page forgings catalog and complete information about MBCo forged parts for your products.

140

MUELLER BRASS CO. PORT HURON 24, MICHIGAN

EVERYTHING
for spray painting and coating

HERE IS A SINGLE SOURCE for everything you need to spray paints or other coatings better, faster and more economically. You have more than 1100 *standard* products from which to choose...all developed from over 50 years of helping manufacturers improve their spray painting and coating operations.

IF YOU HAVE A PROBLEM involving the spraying of paint or other fluids...from water to heavy asphaltic materials...Binks engineers are ready to help you work out the simplest, best and lowest cost solution. If you want spray painting or coating equipment or service...fast ...a *single* call or order to one of Binks' 6000 Jobbers and Distributors will do the trick. It's simple to get exactly what you want, when you want it, when you standardize on Binks' *complete* line.

Binks
EVERYTHING FOR SPRAY PAINTING

ASK YOUR DISTRIBUTOR
for a copy of Binks' big 956 Catalog-Data Book which describes the complete line, or write direct to the address below on your company letterhead. No obligation.

BINKS MANUFACTURING COMPANY
3124-30 Carroll Ave. West, Chicago 12, Ill.

REPRESENTATIVES IN PRINCIPAL U. S. & CANADIAN CITIES • SEE YOUR CLASSIFIED DIRECTORY

JULY

DROP FORGING ASSN.—Annual meeting, July 19-22, Grove Park Inn, Asheville, N. C. Association headquarters are at 605 Hanna Bldg., Cleveland.

TRUCK TRAILER MANUFACTURERS ASSN., INC.—Summer meeting, July 21-23, Detroit. Association headquarters are at Room 710, Albee Bldg., Washington.

SEPTEMBER

AMERICAN MACHINE TOOL DISTRIBUTORS ASSN.—Annual meeting, Sept. 5-6, The Blackstone, Chicago. Association headquarters are at 1900 Arch St., Philadelphia.

NATIONAL MACHINE TOOL BUILDERS' ASSN.—Machine Tool Show, Sept. 6-17, International Amphitheatre, Chicago. Association headquarters are at 2071 E. 102nd St., Cleveland.

INSTRUMENT SOCIETY OF AMERICA—Annual meeting, Sept. 12-16, Shrine Auditorium, Los Angeles. Society headquarters are at 1319 Allegheny Ave., Pittsburgh.

PACKAGING MACHINERY MANUFACTURERS INSTITUTE—Annual meeting, Sept. 15-18, The Homestead, Hot Springs, Va. Institute headquarters are at 342 Madison Ave., New York.

ASSN. OF IRON & STEEL ENGINEERS—Annual convention, Sept. 26-29, Sherman Hotel, Chicago. Association headquarters are at 1010 Empire Bldg., Pittsburgh.

MARKING DEVICE ASSN. — National convention, Sept. 27-30, Edgewater Beach Hotel, Chicago. Association headquarters are at 912 Chicago Ave., Evanston, Ill.

OCTOBER

AMERICAN WELDING SOCIETY, INC.—Fall technical meeting, Oct., Philadelphia. Society headquarters are at 33 W. 39th St., New York.

THE ELECTROCHEMICAL SOCIETY, INC.—Semiannual fall meeting, Oct. 9-13, William Penn Hotel, Pittsburgh. Society headquarters are at 216 W. 102nd St., New York.

TRUCK BODY & EQUIPMENT ASSN., INC. — Annual meeting, Oct. 10-12, Morrison Hotel, Chicago. Association headquarters are at 403 Washington Board of Trade Bldg., Washington.

GAS APPLIANCE MANUFACTURERS ASSN.—Annual meeting, Oct. 12-14, El Mirador, Palm Springs, Calif. Association headquarters are at 60 E. 42nd St., New York.

FOUNDRY EQUIPMENT MANUFACTURERS ASSN., INC.—Annual meeting, Oct. 13-15, The Greenbrier Hotel, White Sulphur Springs, West. Va. Association headquarters are at One Thomas Circle, Washington, D. C.

AMERICAN GAS ASSN.—Annual meeting, Oct. 17-19, Los Angeles. Association headquarters are at 420 Lexington Ave., New York.

AMERICAN SOCIETY FOR METALS—National metal congress and exposition, Oct. 17-21, Philadelphia. Society headquarters are at 7301 Euclid Ave., Cleveland.

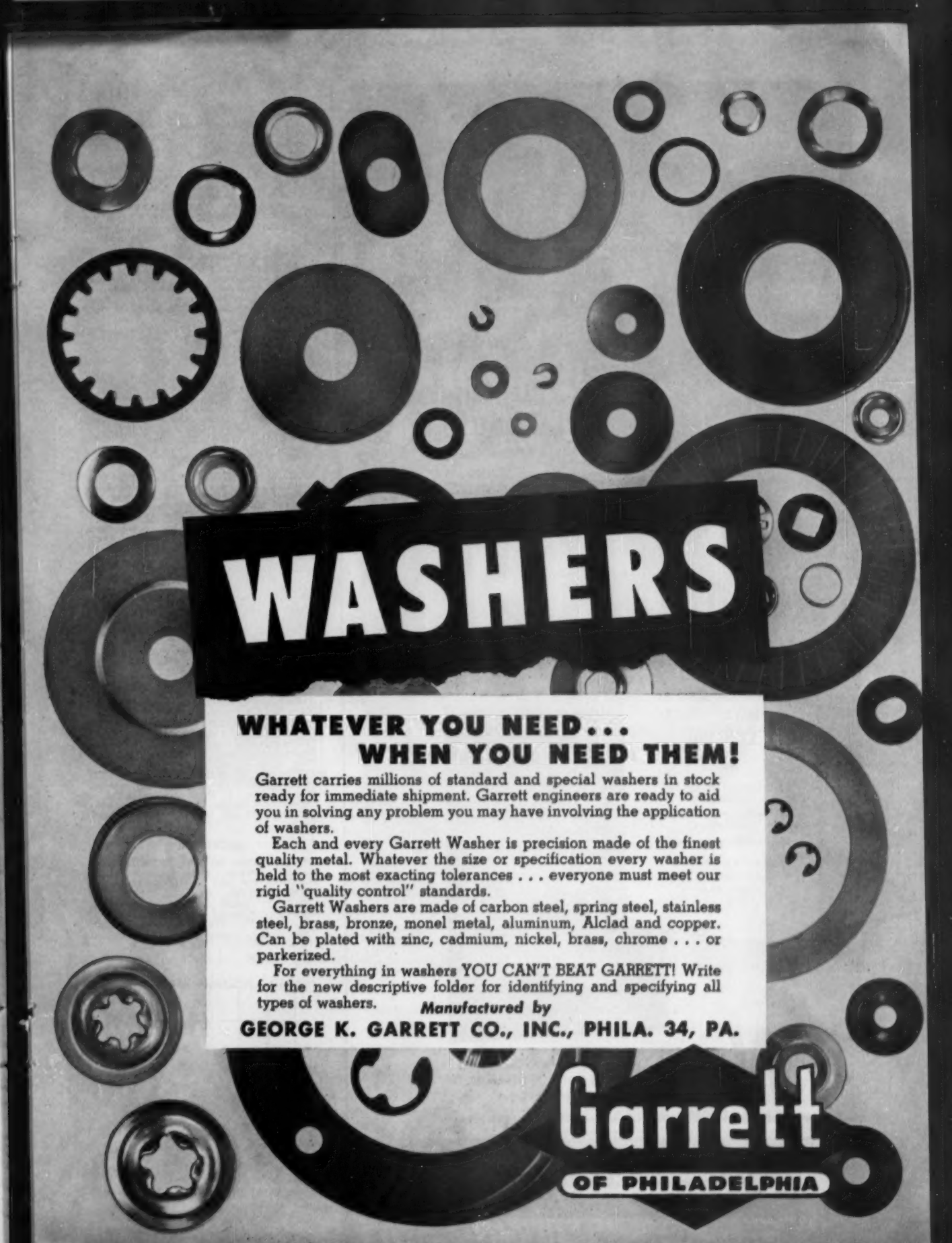
CONVEYOR EQUIPMENT MANUFACTURERS ASSN.—Annual meeting, Oct. 15-18, The Greenbrier, White Sulphur Springs, West Va. Association headquarters are at No. 1 Thomas Circle, Washington, D. C.

AMERICAN COKE & COAL CHEMICALS INSTITUTE—Annual meeting, Oct. 17-18, The Greenbrier, White Sulphur Springs, West Va. Institute headquarters are at 711 Fourteenth St., N.W., Washington, D. C.

GRAY IRON FOUNDERS SOCIETY, INC.—National annual meeting, Oct. 20-21, Schroeder Hotel, Milwaukee. Society headquarters are at 930 National City-E. 6th Bldg., Cleveland.

AMERICAN HARDWARE MANUFACTURERS ASSN.—Fall meeting, Oct. 23-26, National Hardware Convention, Atlantic City, N. J. Association headquarters are at 342 Madison Ave., New York.

NATIONAL ASSN. OF SHEET METAL DISTRIBUTORS—Annual meeting, Oct. 23-26, Marlborough-Blenheim Hotel, Atlantic City, N. J. Association headquarters are at 1900 Arch St., Philadelphia.



WHATEVER YOU NEED... WHEN YOU NEED THEM!

Garrett carries millions of standard and special washers in stock ready for immediate shipment. Garrett engineers are ready to aid you in solving any problem you may have involving the application of washers.

Each and every Garrett Washer is precision made of the finest quality metal. Whatever the size or specification every washer is held to the most exacting tolerances . . . everyone must meet our rigid "quality control" standards.

Garrett Washers are made of carbon steel, spring steel, stainless steel, brass, bronze, monel metal, aluminum, Alclad and copper. Can be plated with zinc, cadmium, nickel, brass, chrome . . . or parkerized.

For everything in washers YOU CAN'T BEAT GARRETT! Write for the new descriptive folder for identifying and specifying all types of washers.

Manufactured by

GEORGE K. GARRETT CO., INC., PHILA. 34, PA.

Garrett

OF PHILADELPHIA

MANUFACTURERS OF THE WORLD'S MOST COMPLETE LINE OF LOCK WASHERS AND FLAT WASHERS

SPECIALISTS IN COLD FINISHED STEELS EXCLUSIVELY

WYCKOFF STEEL CO.

General Offices: Gateway Center Pittsburgh 30, Pa.

Branch Offices in Principal Cities

Works: Ambridge, Pa. • Chicago, Ill. • Newark, N. J. • Putnam, Conn.

WYCKOFF STEEL PRODUCTS — Carbon and Alloy Steels • Turned and Polished Shafting • Turned and Ground Shafting • Wide Flats up to 12" x 2" All types of furnace treated Steels

MEETINGS

RAIL STEEL BAR ASSN.—Fall meeting, Oct. 24-25, Sherman Hotel, Chicago. Association headquarters are at 38 S. Dearborn St., Chicago.

AMERICAN GEAR MANUFACTURERS ASSN.—Semiannual meeting, Oct. 25-26, Edgewater Beach Hotel, Chicago. Association headquarters are at One Thomas Circle, Washington, D. C.

STEEL FOUNDERS' SOCIETY OF AMERICA—Annual fall meeting, Oct. 24-25, The Greenbrier, White Sulphur Springs, W. Va. Society headquarters are at 920 Midland Bldg., Cleveland.

AMERICAN STANDARDS ASSN.—National conference and standards and aanual meeting, Oct. 24-26, Sheraton Park Hotel, Washington, D. C. Association headquarters are at 70 E. 45th St., New York.

STEEL BOILER INSTITUTE, INC.—Fall meeting, Oct. 25-26, Williamsburg Inn, Williamsburg, Va. Institute headquarters are 1368 Land Title Bldg., Philadelphia.

PORCELAIN ENAMEL INSTITUTE—Annual meeting, Oct. 26-28, The Greenbrier, White Sulphur Springs, W. Va. Institute headquarters are at Dupont Circle Bldg., 1346 Connecticut Ave., N.W., Washington, D. C.

NOVEMBER

GRINDING WHEEL INSTITUTE—Fall meeting, Nov. 1-3, Statler Hotel, Buffalo, N. Y. Institute headquarters are at 2130 Keith Bldg., Cleveland.

NATIONAL TOOL & DIE MANUFACTURERS ASSN.—Annual convention, Nov. 3-6, Statler Hotel, Detroit. Association headquarters are at 907 Public Square Bldg., Cleveland.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS—Diamond Jubilee annual meeting, Nov. 13-18, Congress, Conrad Hilton and Blackstone Hotels, Chicago. Society headquarters are at 29 W. 39th St., New York.

NATIONAL METAL TRADES ASSN.—Convention, Nov. 14-16, Commodore Hotel, New York. Association headquarters are at 122 S. Michigan Ave., Chicago.

THE WIRE ASSN.—Annual meeting, Nov. 14-17, La Salle Hotel, Chicago. Association headquarters are at 453 Main St., Stamford, Conn.

AMERICAN INSTITUTE OF CHEMICAL ENGINEERS—Annual meeting, Nov. 27-30, Statler Hotel, Detroit. Institute headquarters are at 25 W. 45th St., New York.

AMERICAN INSTITUTE OF STEEL CONSTRUCTION—Annual convention, Nov. 27-Dec. 2, Boca Raton Hotel & Club, Boca Raton, Fla. Institute headquarters are at 101 Park Ave., New York.

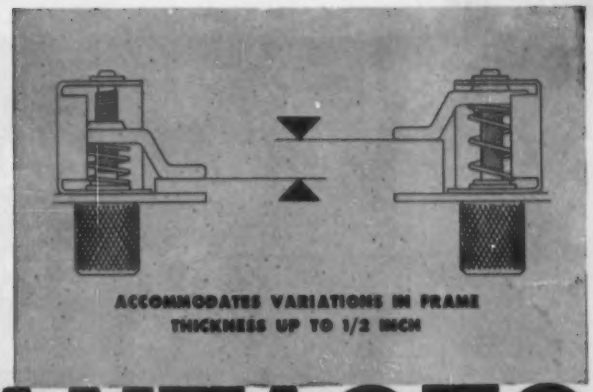
DECEMBER

THE AMERICAN MINING CONGRESS—Annual meeting, Dec. 6, New York. Headquarters are at 1200 18th St., Washington.

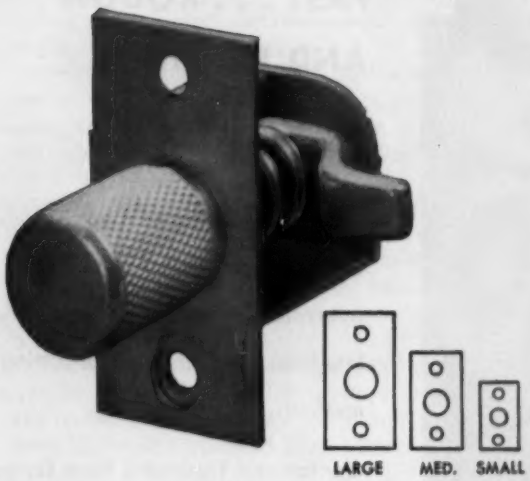
NATIONAL ASSN. OF MANUFACTURERS—Congress of American Industry, Dec. 7-9, The Waldorf-Astoria Hotel, New York. Association headquarters are at 14 W. 49th St., New York.

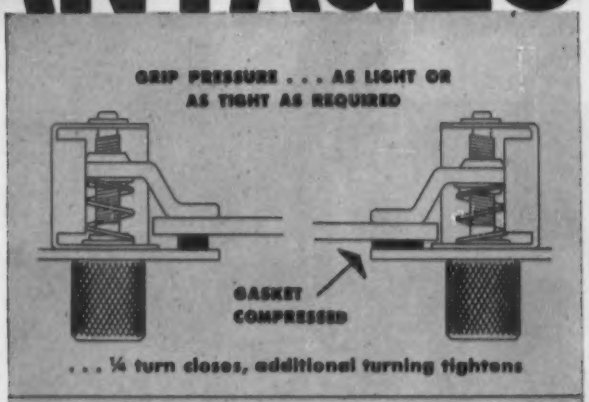
"Shows what an incentive system will do."

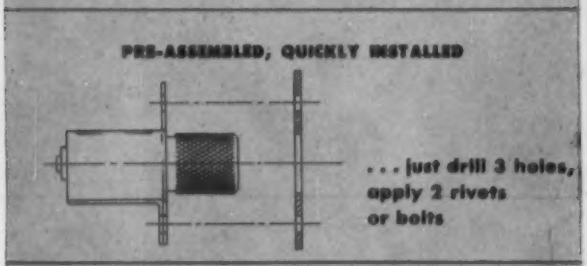
a family of door fasteners with



BIG ADVANTAGES







Get the complete story of Southco Pawl Fastener advantages. Write today for your copy of the Southco Fastener Handbook. Southco Division, South Chester Corporation, 238 Industrial Highway, Lester, Pa.

©1954

SOUTHCO

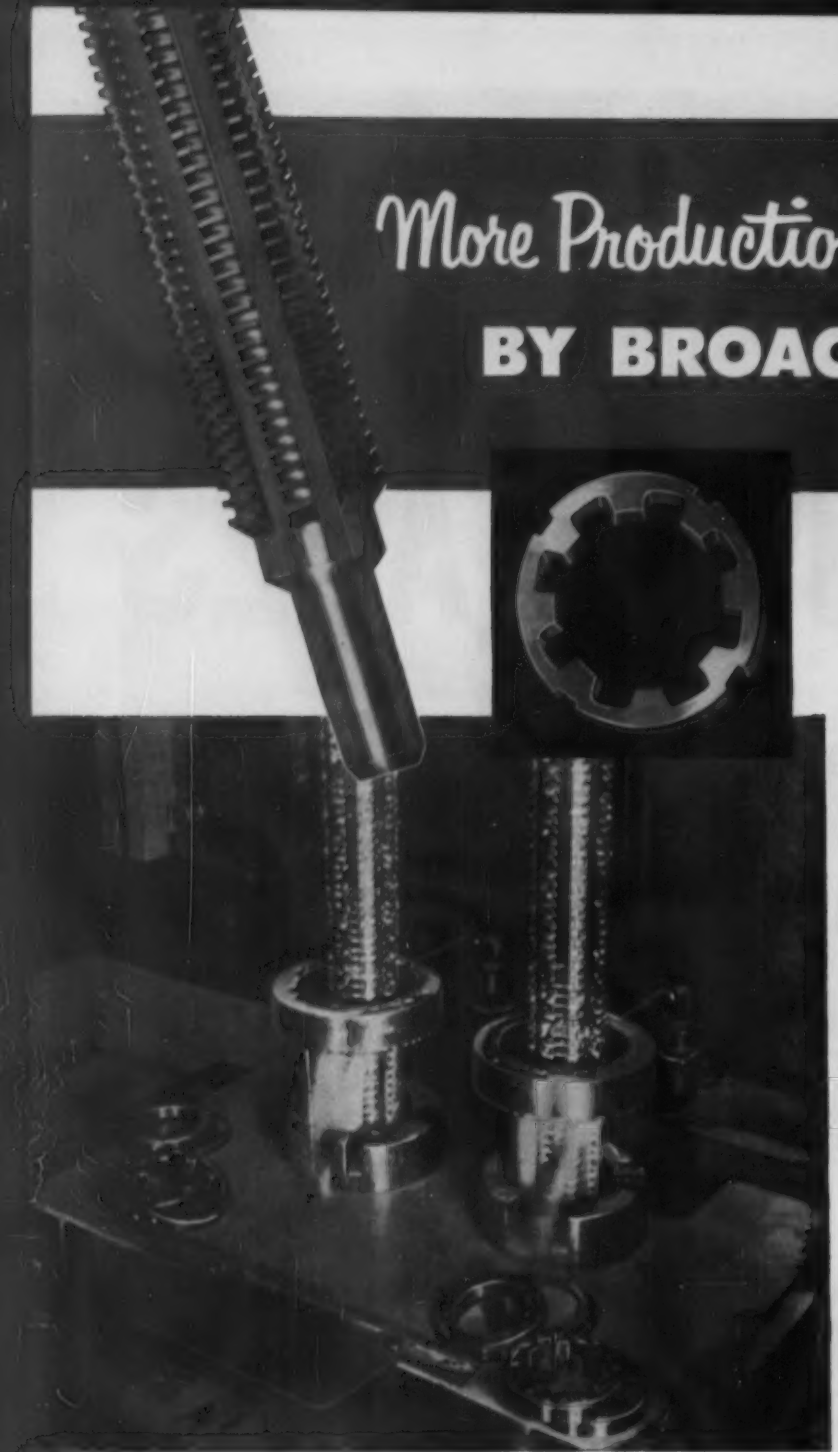
FASTENERS

PAWL • SCREW AND SPRING • DRIVE RIVETS • ANCHOR NUTS • ENGINEERED SPECIALTIES

OFFICES IN PRINCIPAL CITIES

WHEREVER TWO OR MORE PARTS ARE FASTENED TOGETHER; STANDARD AND SPECIAL DESIGNS FOR IMPROVED PERFORMANCE AND LOWER PRODUCTION COSTS

More Production, More Profit BY BROACHING . . .



Internal broaching of a cam ring. The spline form has unsymmetrical sides and cam form on the major diameter. The steel is soft and tends to tear, yet this Continental Broach sizes the I.D. and cuts 8 splines 5/16" deep *in one pass.*

REMOVE STOCK TO PRECISION LIMITS FAST . . . ROUGH AND FINISH IN ONE PASS!

The scope of Broaching has broadened in recent years. Many broaching operations do precision work in far less time than other metal-cutting methods.

Continental Engineers have for years been designing all types of cutting tools, broaches and broaching fixtures. They can recommend the most economical way to do your work.

For facts about increasing your production by broaching, call in your local Ex-Cell-O representative—or write Continental in Detroit for Cutting Tool Catalog.

CTW

Continental TOOL WORKS

DIVISION OF EX-CELL-O CORPORATION
DETROIT 32, MICHIGAN

84-15

STEEL OUTLOOK

Markets and Prices

The Iron Age SUMMARY. . .

Ingot rate bounced back from holiday schedules . . . Additional gains expected during first quarter . . . Bars reflect general improvement.

Production . . . Robust health of the steel market is apparent this week from a check of producing mills by THE IRON AGE. The industry is starting the new year with a bang. And it seems likely that 1955 production will rise to about 100 to 105 million tons of ingots, compared with 88.3 million tons produced in 1954, a year which most people considered pretty good.

Steelmaking operations this week are scheduled at 81.0 pct of rated capacity, a gain of 3.5 points from last week. A sharp rise in production after the holidays had been anticipated.

Outlook . . . Production is expected to rise still higher during the first quarter. Within the next few weeks the ingot rate may exceed 85 pct of rated capacity, and the average rate for the quarter is expected to be right around that figure.

First quarter capacity on flat rolled products such as hot and cold-rolled sheets and galvanized sheets is already virtually sold out. A spurt in tinplate business is also expected soon.

Demand . . . Tightening of the market for flat-rolled steel of course reflects high production schedules of auto producers. They are expected to exert even greater pressure right up to the end of May when present wage contracts of General Motors and Ford expire. There is no doubt that those responsible for setting production schedules will be mindful of the labor situation.

But the hot market for flat-rolled products isn't due entirely to demand from auto companies; appliance makers have recently raised their sights, as 1955 promises to be a better year for them.

One of the most convincing signs of solid recovery in the steel market is the turnabout in hot-rolled carbon bars. The bar market was slower to improve than the flat-rolled market, but it is coming along strongly now. This is important because bars are used in a great many diversified manufactured articles.

Cold finished bars and alloy bars are also making a solid comeback. Structural steel is seasonally weaker and oil country goods is still undergoing a belated inventory correction. But these items are headed for another outstanding year because construction and oil industries are pointed toward new records.

Prices . . . The steel scrap market is somewhat stronger this week. THE IRON AGE Steel Scrap Composite Price rose $1.34 a ton to $34.17.

Steel Output, Operating Rates

Production (Net tons, 000 omitted)	This Week†	Last Week	Month Ago	Year Ago
Ingot Index (1947—49=100)	....	....	....	....
Operating Rates				
Chicago	83.5	83.0*	89.5	80.0
Pittsburgh	77.0	74.0	77.0	90.0
Philadelphia	70.0	65.0	71.0	83.0
Valley	79.0	68.0	79.0	71.0
West	84.0	78.5	87.0	76.5
Detroit	91.0	91.0	88.0	85.0
Buffalo	100.0	100.0	100.0	75.0
Cleveland	83.0	83.0	90.0	81.0
Birmingham	74.5	62.5	66.5	95.0
S. Ohio River	94.5	86.0	78.0	79.5
Wheeling	93.0	85.0	100.0	88.0
St. Louis	74.5	74.5	80.0	67.0
Northeast	74.5	46.0	78.0	74.5
Aggregate	81.0	77.5	82.0	75.0

*Revised. †Tentative

Prices At A Glance

(cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite prices				
Finished Steel, base	4.797	4.797	4.797	4.634
Pig Iron (gross ton)	$56.59	$56.59	$56.59	$56.59
Scrap, No. 1 hvy (gross ton)	$34.17	$32.83	$32.17	$29.67
Nonferrous				
Aluminum, ingot	22.20	22.20	22.20	21.50
Copper, electrolytic	30.00	30.00	30.00	29.75
Lead, St. Louis	14.80	14.80	14.80	13.30
Magnesium, ingot	27.75	27.75	27.75	27.75
Nickel, electrolytic	67.67	67.67	67.67	63.08
Tin, Straits, N. Y.	88.00	87.125	89.875	85.00
Zinc, E. St. Louis	11.50	11.50	11.50	10.00

Salesmen Happy About 1955

Strong steel market assured for first 5 months at least . . . Automotive uncertain after that . . . But even if Detroit falters, steel will set a fair pace through '55.

◆ CRYSTAL BALLS in steel sales offices reflect a bright market picture for the first 5 months of 1955. Beyond that, outlook becomes somewhat hazy due largely to uncertainties about automotive production.

Nevertheless, prospects for virtually all steel products look good for most of the year. There are so many plus factors apart from automotive that, even if the carmakers run into labor or market troubles, steel demand will continue to set a fair pace in 1955.

Steel producers are counting on good support from the construction and oil industries. In terms of products this means good demand for structurals, reinforcing bars, construction wire products, galvanized sheets, merchant pipe, nails, and oil country goods.

Natural gas pipeline projects expected to break in first quarter are another encouraging factor. This spells plates to the steel producers.

Railroads are pretty much a question mark but even here there are signs that 1955 will show a big improvement over last year. Even a mild spurt would be better than the inertia of 1954. When the railroads get going, orders begin to mount for plates, sheets, light structurals, industrial fasteners, bars, rails, track spikes and the like.

Farm market looks good and that means steady demand for merchant wire products and the many steel items that go into farm equipment.

Appliances and TV are other plus factors. And the electric power industry is shaping up well for 1955. This spells good business for producers of hot- and cold-rolled sheets, electrical sheets, some plates, enameling sheets, and stainless steel, which already is going strong on the basis of automotive, appliances, chemicals, and dairy.

Bar outlook is a little shadowy despite recent improvement. Some producers complain that hot-rolled carbon bars are not moving into automotive as well as they would like. Alloy bars probably will shape up better than carbon in both hot-rolled and cold-finished.

SHEETS AND STRIP . . . Cold-rolled sheets will be tight through April. After that it will depend on automotive. Second quarter might be off slightly from first quarter. Every producing center in the country reports the same story on cold-rolled sheets—demand is terrific. Hot-rolled is something else again although deliveries are becoming more extended. Drawback here is that automakers use little hot-rolled except in frames. Same goes for appliances. Warehouse demand expected to pick up in second quarter. Bolstered by automotive, strip is strong but not comparable to sheets.

BARS . . . First half demand is shaping up as fair. The market has improved but not up to expectations. Although disappointing, automotive demand has been the big factor in carbon and alloy improvement. More support is expected from farm equipment builders beginning this month. Bridge and highway construction will lift reinforcing bars from present slack period in second quarter. Cold-finished bars are limping relatively but liquidation of warehouse inventories expected to improve market in second quarter.

GALVANIZED SHEETS . . . This looks like an extremely strong product through first half at least and probably throughout first 3 quarters. Continuous is more extended than hot-dip, though both are strong. Construction and air conditioning are big factors here.

TINPLATE . . . Due largely to heavy inventories in hands of consumers, one in particular, tinplate has been relatively soft and January is not expected to show any improvement. The pickup is looked for in February-March, with a good market through June as inventories are depleted and the can companies prepare for the late summer and fall harvests. There are other things going for tinplate, including the growing soft drink market.

STAINLESS . . . Producers look for a good year. Most optimistic reports emanate from a midwestern producing center, where sales officials are talking about a 90 pct year. Good all-around demand from a varety of industries provides the basis for optimism.

ELECTRICAL SHEET . . . Market looks good for first half. Stepped up demand for fractional hp motors and television and radio, already making for a strong market, will be augmented in first quarter by a boost in orders from electric power industry for transformers. Production is certain to be better than 1954's 600,000 tons, worst since 1949.

STRUCTURALS . . . It looks like a good first half for structurals although market is currently off seasonally. Prospects for a good year in highway, bridge, and building construction spell another busy period for structural producers. Improvement in railroad car building would help light structurals.

PLATES . . . Market has a good potential despite current inactivity. Boost is almost certain from large pipeline projects now pending and expected to break in first quarter. Even a slight pickup in railroad car building would be an improvement over 1954.

Purchasing Agent's Checklist

INDUSTRY: Back in high gear at the year's end . . . . . p. 163

AUTOMOBILES: Outlook is good; labor the unknown factor . . p. 212

MACHINE TOOLS: Hope for 1955 to equal last year's total . . . p. 223

DEFENSE: Military purchasing will be up in 1955 . . . . . p. 225

Comparison of Prices

(Effective Jan. 4, 1955)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

	Jan. 4 1955	Dec. 28 1954	Dec. 7 1954	Jan. 5 1954
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	4.05¢	4.05¢	4.05¢	3.925¢
Cold-rolled sheets	4.95	4.95	4.95	4.775
Galvanized sheets (10 ga.)	5.45	5.45	5.45	5.275
Hot-rolled strip	4.05	4.05	4.05	3.925
Cold-rolled strip	5.79	5.79	5.79	5.513
Plate	4.225	4.225	4.225	4.10
Plates wrought iron	9.80	9.80	9.80	9.80
Stain'l's C-R strip (No. 302)	41.50	41.50	41.50	41.50
Tin and Ternplate: (per base box)				
Tinplate (1.50 lb.) cokes	$9.05	$9.05	$9.05	$8.95
Tinplate, electro (0.50 lb.)	7.75	7.75	7.75	7.65
Special coated mfg. ternes	7.85	7.85	7.85	7.75
Bars and Shapes: (per pound)				
Merchant bars	4.30¢	4.30¢	4.30¢	4.16¢
Cold-finished bars	5.40	5.40	5.40	5.20
Alloy bars	5.075	5.075	5.075	4.875
Structural shapes	4.25	4.25	4.25	4.10
Stainless bars (No. 302)	35.50	35.50	35.50	35.50
Wrought iron bars	10.40	10.40	10.40	10.40
Wire: (per pound)				
Bright wire	5.75¢	5.75¢	5.75¢	5.525¢
Rails: (per 100 lb.)				
Heavy rails	$4.45	$4.45	$4.45	$4.325
Light rails	5.35	5.35	5.35	5.20
Semifinished Steel: (per net ton)				
Rerolling billets	$64.00	$64.00	$64.00	$62.00
Slabs, rerolling	64.00	64.00	64.00	62.00
Forging billets	78.00	78.00	78.00	75.50
Alloy blooms, billets, slabs	86.00	86.00	86.00	82.00
Wire Rod and Skelp: (per pound)				
Wire rods	4.675¢	4.675¢	4.675¢	4.525¢
Skelp	3.90	3.90	3.90	3.75
Finished Steel Composite: (per pound)				
Base price	4.797¢	4.797¢	4.797¢	4.634¢

	Jan. 4 1955	Dec. 28 1954	Dec. 7 1954	Jan. 5 1954
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$61.19	$61.19	$61.19	$61.19
Foundry, Valley	56.50	56.50	56.50	56.50
Foundry, Southern, Cin'ti	60.43	60.43	60.43	60.43
Foundry, Birmingham	52.88	52.88	52.88	52.88
Foundry, Chicago	56.50	56.50	56.50	56.50
Basic del'd Philadelphia	60.27	60.27	60.27	60.27
Basic, Valley furnace	56.00	56.00	56.00	56.00
Malleable, Chicago	56.50	56.50	56.50	56.50
Malleable, Valley	56.50	56.50	56.50	56.50
Ferromanganese‡, cents per lb.	9.50¢	9.50¢	9.50¢	10.00¢
‡ 74-76 pct Mn base.				
Pig Iron Composite: (per gross ton)				
Pig iron	$56.59	$56.59	$56.59	$56.59
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$36.50	$33.50	$32.50	$30.50
No. 1 steel, Phila. area	31.50	31.50	31.50	29.00
No. 1 steel, Chicago	34.50	33.50	32.50	29.50
No. 1 bundles, Detroit	26.50	27.50	26.50	22.50
Low phos., Youngstown	36.50	35.50	35.50	31.50
No. 1 mach'y cast, Pittsburgh	42.50	42.50	42.50	43.50
No. 1 mach'y cast, Philadel'a	42.00	42.00	42.00	40.50
No. 1 mach'y cast, Chicago	44.50	44.00	43.00	36.50
Steel Scrap Composite: (per gross ton)				
No. 1 heavy melting scrap	$34.17	$32.83	$32.17	$29.67
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.38	$14.38	$14.38	$14.38
Foundry coke, prompt	16.75	16.75	16.75	16.75
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	30.00	30.00	30.00	29.75‡
Copper, Lake, Conn.	30.00	30.00	30.00	30.00
Tin, Straits, New York	88.00†	87.125°	89.875	85.00
Zinc, East St. Louis	11.50	11.50	11.50	10.00
Lead, St. Louis	14.30	14.30	14.30	13.30
Aluminum, virgin ingot	22.20	22.20	22.20	21.50
Nickel, electrolytic	67.67	67.67	67.67	65.08
Magnesium, ingot	27.75	27.75	27.75	27.75
Antimony, Laredo, Tex.	28.50	28.50	28.50	28.50

† Tentative. ‡ Average. ° Revised.

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

←To identify producers, see Key on P. 335→

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Bethlehem *B3*	58.00	58.50	59.00	59.50	.....
Birmingham *R3*	52.38	52.88	.....	.....	.....
Birmingham *W9*	52.38	52.88	.....	.....	.....
Birmingham *U4*	52.38	52.88	56.50	.....	.....
Buffalo *R3*	56.00	56.50	57.00	.....	.....
Buffalo *I1*	56.00	56.50	57.00	.....	.....
Buffalo *W6*	56.00	56.50	57.00	.....	.....
Chicago *I4*	56.00	56.50	56.50	57.00	.....
Cleveland *A5*	56.00	56.50	56.50	57.00	61.00
Cleveland *R3*	56.00	56.50	56.50	.....	.....
Daingerfield *L3*	52.50	52.50	52.50	.....	.....
Duluth *I4*	56.00	56.50	56.50	57.00	.....
Erie *I4*	56.00	56.50	56.50	57.00	.....
Everett *M6*	.....	61.00	61.50	.....	.....
Fontana *K1*	62.00	62.50	.....	.....	.....
Geneva, Utah *C7*	56.00	56.50	.....	.....	.....
Granite City *G2*	57.90	58.40	58.90	.....	.....
Hubbard *Y1*	.....	.....	56.50	.....	.....
Minnequa *C6*	56.00	59.00	59.00	.....	.....
Monessen *P6*	56.00	.....	.....	.....	.....
Neville Isl. *P4*	56.00	56.50	56.50	.....	.....
Pittsburgh *U1*	56.00	.....	.....	57.00	.....
Sharpsville *S3*	56.00	56.50	56.50	57.00	.....
So. Chicago *R3*	56.00	.....	56.50	.....	.....
Steelton *B3*	58.00	58.50	59.00	59.50	64.00
Swedeland *A3*	58.00	58.50	59.00	59.50	.....
Toledo *I4*	56.00	56.50	56.50	57.00	.....
Troy, N. Y. *R3*	58.00	58.50	59.00	59.50	64.00
Youngstown *Y1*	.....	.....	56.50	57.00	.....
N. Tonawanda *T1*	.....	56.50	57.00	.....	.....

DIFFERENTIALS: Add 50¢ per ton for each 0.25 pct silicon over base (1.75 to 2.25 pct except low phos., 1.75 to 1.80 pct) 50¢ per ton for each 0.50 pct manganese over 1 pct, $2 per ton for 0.5 to 0.75 pct nickel, $1 for each additional, 0.25 pct nickel. Subtract 38¢ per ton for phosphorus content 0.70 and over.

Silvery Iron: Buffalo, *H1*, $66.25; Jackson, *J1, G1*, $65.00. Add $1.00 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 17 pct. Add $1 per ton for 0.75 pct or more phosphorus. Add 75¢ for each 0.50 pct manganese over 1.0 pct. Bessemer ferrosilicon prices are $1 over comparable silvery iron.

STAINLESS STEEL

Base price cents per lb. f.o.b. mill.

Product	301	302	303	304	316	321	347 Cb	410	416	430
Ingots, rerolling	16.75	17.75	19.25	19.00	29.25	23.50	25.50	14.00	—	14.25
Slabs, billets, rerolling	21.00	23.25	25.25	24.50	37.50	30.25	46.75	18.25	—	18.50
Forg. discs, die blocks, rings	39.00	39.00	42.00	41.25	61.25	46.25	—	31.00	31.75	31.75
Billets, forging	30.00	30.25	32.75	31.75	47.75	36.00	54.75	24.00	24.50	24.50
Bars, wires, structurals	35.75	36.00	38.75	38.00	56.75	42.75	64.25	28.75	29.25	29.25
Plates	37.75	38.00	40.25	40.50	60.00	46.50	69.25	30.00	30.50	30.50
Sheets	41.75	42.00	45.25	44.50	64.00	51.25	77.50	34.25	41.25	34.75
Strip, hot-rolled	30.25	32.50	37.25	35.00	54.50	41.75	63.00	26.25	—	27.00
Strip, cold-rolled	38.75	42.00	46.00	44.50	64.00-64.25	51.25-51.50	77.50	34.25	41.25	34.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11*; Brackenridge, Pa., *A3*; Butler, Pa., *A7*; McKeesport, Pa., *U1*; Washington, Pa., *W2, J3*; Baltimore, *E1*; Middletown, O., *A7*; Massillon, O., *R3*; Gary, *U1*; Bridgeville, Pa., *U2*; New Castle, Ind., *I2*; Ft. Wayne, *J4*.

Strip: Midland, Pa., *C11*; Cleveland, *A5*; Carnegie, Pa., *S9*; McKeesport, Pa., *F1*; Reading, Pa., *C2*; Washington, Pa., *W2*; W. Leechburg, Pa., *A3*; Bridgeville, Pa., *U2*; Detroit, *M2*; Canton-Massillon, O., *R3*; Middletown, O., *A7*; Harrison, N. J., *D3*; Youngstown, *C5*; Sharon, Pa., *S1*; Butler, Pa., *A7*; Wallingford, Conn., *U3* (.25¢ per lb higher) *W1* (.25¢ per lb higher); New Bedford, Mass., *R6*.

Bar: Baltimore, *A7*; Duquesne, Pa., *U1*; Munhall, Pa., *U1*; Reading, Pa., *C2*; Titusville, Pa., *U2*; Washington, Pa., *J3*; McKeesport, Pa., *U1, F1*; Bridgeville, Pa., *U2*; Dunkirk, N. Y., *A3*; Massillon, O., *R3*; Chicago, *U1*; Syracuse, N. Y., *C11*; Watervliet, N. Y., *A3*; Waukegan, *A3*; Canton, O., *T5*; Ft. Wayne, *I4*.

Wire: Waukegan, *A3*; Massillon, O., *R3*; McKeesport, Pa., *F1*; Ft. Wayne, *J4*; Harrison, N. J., *D3*; Baltimore, *A7*; Dunkirk, *A3*; Monessen, *P1*; Syracuse, *C11*; Bridgeville, *U2*.

Structurals: Baltimore, *A7*; Massillon, O., *R3*; Chicago, Ill., *J4*; Watervliet, N. Y., *A3*; Syracuse, *C11*.

Plates: Brackenridge, Pa., *A3*; Chicago, *U1*; Munhall, Pa., *U1*; Midland, Pa., *C11*; New Castle, Ind., *I3*; Middletown, *A7*; Washington, Pa., *J2*; Cleveland Massillon, *R3*; Coatesville, Pa., *C15*.

Forged discs, die blocks, rings: Pittsburgh, *C11*; Syracuse, *C11*; Forndale, Minn., *A3*; Washington, Pa., *J3*.

Forgings billets: Midland, Pa., *C11*; Baltimore, *A7*; Washington, Pa., *J3*; McKeesport, *F1*; Massillon, Canton, O., *R3*; Watervliet, *A3*; Pittsburgh, Chicago, *U1*; Syracuse, *C11*

See Healthy Market For '55

Predict upturn of last half of 1954 will continue . . . Iron and steel industries consumed 23 million gross tons of scrap last year . . . Exports showed big gains.

◆ THE TREND in scrap for the coming year reflects directly the trend in the metal products into which it enters. There are indications that the momentum which was generated in the third and fourth quarters of 1954 would carry at least into the second quarter of 1955.

Although there were substantial increases in exports of scrap in 1954, totalling 1.25 million gross tons, some 5 pct of 23 million gross tons of domestic consumption, there were no shortages of metallics for either steel mills or iron foundries.

To produce 78.8 million gross tons of steel ingots and 10.7 million gross tons of iron castings, in 1954 the iron and steel industry melted 107 million tons of metallics of all kinds—purchased and home scrap and pig iron. This compared with 132.5 million gross tons of metallics consumed in 1953 to make 118.5 million gross tons of ingots and 13 million gross tons of castings.

The leading grade of scrap, tonnagewise, in 1954 continued to be hydraulic compressed bundles made principally from old automobile bodies; this accounted for 20.5 pct of the total consumption of that purchased on the open market.

Pittsburgh . . . The price of No. 1 heavy melting steel jumped $3 per ton to $37, top, this week. The buy was made by a large consumer for a district operation. On the same deal, No. 2 steel moved up $4 per ton to $34, and No. 2 bundles were advanced $2 to $29 per ton. Same prices were paid later by a smaller consumer on fringe of the district. Other grades moved up in sympathy with these new purchases.

Chicago . . . Chicago's market moved up another $1 last week, justifying advancing dealer and broker prices of the past two weeks. As steelmaking grades moved up generally, both electric furnace and cast were showing decided firmness and only turnings remained static.

Philadelphia . . . Holiday doldrums continued with little tonnage moving. What business there was went at the prevailing price ranges. Most brokers believe that unless mills come into the market soon a good deal of scrap will move at the lower end of current price ranges.

Cleveland . . . Valley price went up $1 on No. 1 heavy melting to $37 while secondary grades rose up to $4 over last purchase price to restore normal differential. In secondary grades mills came in at $33 for No. 2 heavy melting and $28.50 for No. 2 bundles. Tonnage was divided between several brokers. Prices on machine shop grades expected to be unchanged for month or so.

Buffalo . . . Fresh buying was reported in steelmaking and cast scrap within prevailing price ranges. The area's top mill placed sizeable orders for steel grades while sustained demand from Canadian sources was reported in cast. Some disappointment is apparent among dealers over failure of the market to reflect current high ingot rate in the district.

Detroit . . . With January industrial lists off anywhere from $.50 to $2.00, openhearth grades in Detroit dropped at least $1.00 on market appraisal. For the first time in months, out-of-district consumers bid higher than local mills for choice automotive bundles. Chicago bidders got No. 1 bundles from a large industrial list at $31.50 on track while others were able to pick up the remainder at figures varying to $30. High inventories and heavy tonnages offered were responsible for the unexpected drop.

St. Louis . . . The usual holiday dullness prevails in the St. Louis scrap market, there being no disposition to buy or sell. It is not expected there will be much buying nor many price changes until after Jan. 15 when the mills will purchase for February delivery. Recent advances in Chicago of No. 2 hvy melting steel and bundles did not cause similar action here, since present prices are in line with the advance.

Boston . . . New England scrap business was definitely on the quiet side during the week between the holidays. Domestic demand is very light — dribbles only — while export deals continue to supply practically all the business transacted. Prices are unchanged from last week's quotations.

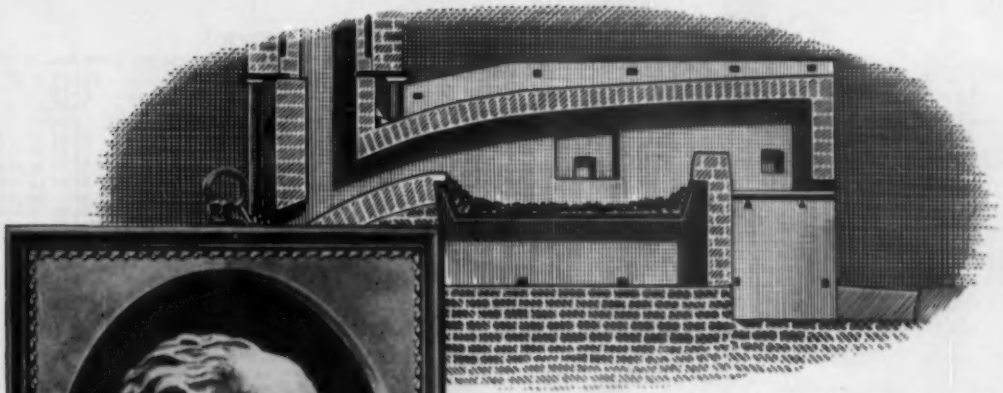
New York . . . With domestic buying almost at a standstill and the holiday cutdown in export scrap movement there were no sales of representative tonnage to change any prices. No changes are looked for until mid-January.

Birmingham . . . Some scrap moved earlier in the week, but during the last days of the year business was at a standstill in the district. Steel mills were out of the market until the first of the year, while foundries that had worked down inventories were ordering for January delivery. Dealers had been building up inventories the last 2 or 3 weeks in anticipation of increased demand after Jan. 1.

Cincinnati . . . Underlying market strength has failed to materialize so far. One major area buyer plans no price changes in January and a second is planning no purchases. Pittsburgh offering sales of No. 2 bundles at $26 delivered by barge and $29 by rail but dealers holding off pending local developments.

West Coast . . . Prices in Los Angeles and San Francisco may continue at same levels although mills and dealers anticipated some lowering. Export activity continues and mills are still in the market. Increased water shipping costs are having dampening effect on export activity. Mill rejections still high. Cast market down $3 in San Francisco, but steady in Los Angeles.

GREAT MOMENTS IN THE HISTORY OF IRON AND STEEL MAKING



Vertical section view of a mid-Eighteenth Century puddling furnace, first used successfully by Henry Cort in 1784 . . . This is the fifth in a series of outstanding inventions and developments that have contributed to the progress of the iron and steel industry.

Henry Cort

1784—Puddling

Although the iron and steel industry took early note of the contribution of Henry Cort's "puddling process", it wasn't until the turn of the century that proper tribute was made to the man who first used coal to refine iron.

Deeply impressed with Cort's genius, a leading American manufacturer of wrought iron located his grave in a forgotten churchyard in Hampstead, England, and had inscribed on his tombstone: "To whom the world is indebted for the arts of refining iron by puddling with mineral coal and of rolling metals in grooved rolls."

Cort's puddling process for the manufacture of wrought iron, even at that time, saved countless thousands of man hours. More significantly, it led to product improvement and versatility. Through the years, engineering skill improved the process to meet increasing industrial demands. Keeping pace with this technological progress is the development in the fields requiring special steels.

These special steels require special scrap of known analysis, a problem particularly suited to our experience, personnel, equipment and the strategic location of our offices. Possibly our facilities may help you solve a problem in iron or steel scrap.

CONSULT OUR NEAREST OFFICE FOR THE PURCHASE AND SALE OF SCRAP

LURIA BROTHERS AND COMPANY, INC.

MAIN OFFICE
LINCOLN-LIBERTY BLDG.
Philadelphia 7, Penna.

PLANTS
LEBANON, PENNA. — DETROIT (ECORSE), MICHIGAN
READING, PENNA.
MODENA, PENNA. — PITTSBURGH, PENNA.
ERIE, PENNA.

OFFICES

BIRMINGHAM, ALA.	DETROIT, MICH.	PITTSBURGH, PENNA.
BOSTON, MASS.	HOUSTON, TEXAS	PUEBLO, COLORADO
BUFFALO, N. Y.	LEBANON, PENNA.	READING, PENNA.
CHICAGO, ILLINOIS	LOS ANGELES, CAL.	ST. LOUIS, MO
CLEVELAND, OHIO	NEW YORK, N. Y.	SAN FRANCISCO, CAL.
	SEATTLE, WASH.	

EXPORTS-IMPORTS —— LIVINGSTON & SOUTHARD, INC. 99 Park Ave., New York, N. Y. *Cable Address:* FORENTRACO

LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Scrap Prices *(Effective Jan. 4, 1915)*

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$36.00 to $37.00
No. 2 hvy. melting	33.00 to 34.00
No. 1 bundles	36.00 to 37.00
No. 2 bundles	28.00 to 29.00
Machine shop turn.	18.00 to 19.00
Mixed bor. and ms. turns.	18.00 to 19.00
Shoveling turnings	22.00 to 23.00
Cast iron borings	22.00 to 23.00
Low phos. punch'gs, plate	40.00 to 41.00
Heavy turnings	33.00 to 34.00
No. 1 RR. hvy. melting	39.00 to 40.00
Scrap rails, random lgth.	42.00 to 43.00
Rails 2 ft and under	48.00 to 49.00
RR. steel wheels	41.00 to 42.00
RR. spring steel	41.00 to 42.00
RR. couplers and knuckles	41.00 to 42.00
No. 1 machinery cast.	42.00 to 43.00
Cupola cast.	26.00 to 27.00
Heavy breakable cast.	32.00 to 33.00

Chicago

No. 1 hvy. melting	$34.00 to $35.00
No. 2 hvy. melting	32.00 to 33.00
No. 1 factory bundles	36.00 to 37.00
No. 1 dealers' bundles	34.00 to 35.00
No. 2 dealers' bundles	24.00 to 25.00
Machine shop turn.	16.00 to 18.00
Mixed bor. and turn.	19.00 to 20.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	19.00 to 20.00
Low phos. forge crops	39.00 to 40.00
Low phos. punch'gs, plate	37.00 to 38.50
Low phos. 3 ft and under	36.00 to 37.00
No. 1 RR. hvy. melting	37.00 to 38.00
Scrap rails, random lgth.	42.00 to 43.00
Rerolling rails	53.00 to 54.00
Rails 2 ft and under	50.00 to 51.00
Locomotive tires, cut	36.00 to 37.00
Cut bolsters & side frames	37.00 to 38.00
Angles and splice bars	44.00 to 45.00
RR. steel car axles	44.00 to 45.00
RR. couplers and knuckles	37.00 to 38.00
No. 1 machinery cast.	44.00 to 45.00
Cupola cast.	39.00 to 40.00
Heavy breakable cast.	31.00 to 32.00
Cast iron brake shoes	33.00 to 34.00
Cast iron car wheels	35.00 to 36.00
Malleable	44.00 to 45.00
Stove plate	33.00 to 34.00

Philadelphia Area

No. 1 hvy. melting	$30.50 to $32.50
No. 2 hvy. melting	28.00 to 29.50
No. 1 bundles	30.50 to 32.50
No. 2 bundles	24.50 to 26.50
Machine shop turn.	17.00 to 18.00
Mixed bor. short turn.	19.00 to 20.00
Cast iron borings	19.00 to 20.00
Shoveling turnings	20.00 to 21.00
Clean cast chem. borings	27.00 to 28.00
Low phos. 5 ft and under	33.50 to 34.00
Low phos. 3 ft and under	34.50 to 35.00
Low phos. punch'gs	34.50 to 35.00
Elec. furnace bundles	32.50 to 33.00
Heavy turnings	29.00 to 30.00
RR. steel wheels	34.50 to 35.00
RR. spring steel	34.50 to 35.00
Rails 18 in. and under	45.00 to 46.00
Cupola cast.	34.00 to 35.00
Heavy breakable cast.	35.00 to 36.50
Cast iron car wheels	41.00 to 42.00
Malleable	41.00 to 42.00
Unstripped motor clocks	27.00 to 28.00
No. 1 machinery cast.	41.00 to 43.00
Charging box cast.	35.00 to 36.00

Cleveland

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 bundles	33.00 to 34.00
No. 2 bundles	26.00 to 27.00
No. 1 busheling	33.00 to 34.00
Machine shop turn.	15.00 to 16.00
Mixed bor. and turn.	20.00 to 21.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	20.00 to 21.00
Cut struct'r'l & plates, 2 ft & under	37.00 to 38.00
Drop forge flashings	33.00 to 34.00
Low phos. punch'gs, plate	36.00 to 37.00
Foundry steel, 2 ft & under	33.00 to 34.00
No. 1 RR. heavy melting	34.00 to 35.00
Rails 2 ft and under	47.00 to 48.00
Rails 18 in. and under	49.00 to 50.00
Railroad grate bars	37.00 to 38.00
Steel axle turnings	37.00 to 38.00
Railroad cast.	.... to 45.00
No. 1 machinery cast.	44.00 to 45.00
Stove plate	38.00 to 39.00
Malleable	.... to 44.00

Youngstown

No. 1 hvy. melting	$36.00 to $37.00
No. 2 hvy. melting	32.00 to 33.00
No. 1 bundles	35.00 to 36.00
No. 2 bundles	27.50 to 28.50
Machine shop turn.	19.00 to 20.00
Shoveling turnings	22.00 to 23.50
Cast iron borings	22.00 to 23.50
Low phos. plate	36.00 to 37.00

Buffalo

No. 1 hvy. melting	$30.00 to $31.00
No. 2 hvy. melting	25.50 to 26.50
No. 1 busheling	30.00 to 31.00
No. 1 bundles	30.00 to 31.00
No. 2 bundles	23.50 to 24.50
Machine shop turn.	18.00 to 19.00
Mixed bor. and turn.	20.00 to 21.00
Shoveling turnings	21.00 to 22.00
Cast iron borings	20.00 to 21.00
Low phos. plate	33.00 to 34.00
Scrap rails, random lgth.	35.00 to 36.00
Rails 2 ft and under	42.00 to 43.00
RR. steel wheels	36.00 to 37.00
RR. spring steel	36.00 to 37.00
RR. couplers and knuckles	36.00 to 37.00
No. 1 machinery cast.	42.00 to 43.00
No. 1 cupola cast.	37.00 to 38.00

Detroit

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$25.00 to $26.00
No. 2 hvy. melting	18.00 to 19.00
No. 1 bundles, openhearth	26.00 to 27.00
No. 2 bundles	18.00 to 19.00
New busheling	25.00 to 26.00
Drop forge flashings	25.00 to 26.00
Machine shop turn.	11.00 to 12.00
Mixed bor. and turn.	13.00 to 14.00
Shoveling turnings	14.00 to 15.00
Cast iron borings	14.00 to 15.00
Low phos. punch'gs, plate	26.00 to 27.00
No. 1 cupola cast.	.... 34.00
Heavy breakable cast.	.... 25.00
Stove plate	.... 30.00
Automotive cast.	.... 38.00

St. Louis

No. 1 hvy. melting	$31.00 to $32.00
No. 2 hvy. melting	28.00 to 29.00
No. 1 bundles	30.00 to 31.00
No. 2 bundles	23.50 to 24.50
Machine shop turn.	15.50 to 16.50
Cast iron borings	15.50 to 16.50
Shoveling turnings	17.00 to 18.00
No. 1 RR. hvy. melting	33.00 to 34.00
Rails, random lengths	39.00 to 40.00
Rails, 18 in. and under	45.50 to 46.50
Locomotive tires, uncut	32.50 to 33.50
Angles and splice bars	33.50 to 34.50
Std. steel car axles	34.50 to 35.50
RR. spring steel	33.50 to 34.50
Cupola cast.	42.00 to 43.00
Hvy. breakable cast.	33.00 to 34.00
Cast iron brake shoes	29.00 to 30.00
Stove plate	34.00 to 35.00
Cast iron car wheels	33.50 to 34.50
Malleable	35.00 to 36.00
Unstripped motor blocks	32.00 to 33.00

Boston

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$22.00 to $23.00
No. 2 hvy. melting	17.00 to 18.00
No. 1 bundles	23.00 to 24.00
No. 2 bundles	16.00 to 17.00
No. 1 busheling	22.00 to 23.00
Elec. furnace, 3 ft & under	24.00 to 25.00
Machine shop turn	7.00 to 8.00
Mixed bor. and short turn.	9.00 to 10.00
Shoveling turnings	10.00 to 11.00
Clean cast chem. borings	17.00 to 18.00
No. 1 machinery cast.	29.00 to 30.00
Mixed cupola cast.	26.00 to 27.00
Heavy breakable cast.	25.00 to 26.00
Stove plate	25.00 to 26.00
Unstripped motor blocks	18.00 to 19.00

New York

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$27.00 to $28.00
No. 2 hvy. melting	24.00 to 25.00
No. 3 bundles	20.00 to 21.00
Machine shop turn.	9.00 to 10.00
Mixed bor. and turn.	10.00 to 11.00
Shoveling turnings	12.00 to 13.00
Clean cast chem. borings	20.00 to 21.00
No. 1 machinery cast.	35.00 to 36.00
Mixed yard cast.	29.00 to 30.00
Charging box cast.	29.00 to 30.00
Heavy breakable cast.	27.00 to 28.00
Unstripped motor blocks	22.00 to 23.00

Birmingham

No. 1 hvy. melting	$28.00 to $29.00
No. 2 hvy. melting	24.00 to 25.00
No. 1 bundles	22.00 to 23.00
No. 2 bundles	19.00 to 20.00
No. 1 busheling	23.00 to 24.00
Machine shop turn.	14.00 to 15.00
Shoveling turnings	15.00 to 16.00
Cast iron borings	15.00 to 16.00
Electric furnace bundles	29.00 to 30.00
Bar crops and plate	33.00 to 34.00
Structural and plate, 2 ft.	33.00 to 34.00
No. 1 RR. hvy. melting	32.00 to 33.00
Scrap rails, random lgth.	36.00 to 37.00
Rails, 18 in. and under	40.00 to 41.00
Angles & splice bars	38.00 to 39.00
Rerolling rails	41.00 to 42.00
No. 1 cupola cast.	45.00 to 46.00
Stove plate	42.00 to 43.00
Charging box cast.	22.00 to 23.00
Cast iron car wheels	33.00 to 34.00
Unstripped motor blocks	35.00 to 36.00
Mashed tin cans	15.00 to 16.00

Cincinnati

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$31.00 to $32.00
No. 2 hvy. melting	26.00 to 27.00
No. 1 bundles	31.00 to 32.00
No. 2 bundles	21.00 to 22.00
Machine shop turn.	13.00 to 14.00
Mixed bor. and turn.	17.00 to 18.00
Shoveling turnings	17.00 to 18.00
Cast iron borings	17.00 to 18.00
Low phos., 18 in. & under	36.00 to 37.00
Rails, random lengths	38.00 to 39.00
Rails, 18 in. and under	46.00 to 47.00
No. 1 cupola cast.	39.00 to 40.00
Hvy. breakable cast.	34.00 to 35.00
Drop broken cast.	44.00 to 45.00

San Francisco

No. 1 hvy. melting	.... $24.00
No. 2 hvy. melting	.... 20.00
No. 1 bundles	.... 23.00
No. 2 bundles	.... 18.00
No. 3 bundles	.... 14.00
Machine shop turn.	.... 6.00
Cast iron borings	.... 9.00
No. 1 RR. hvy. melting	.... 34.00
No. 1 cupola cast.	.... 40.00

Los Angeles

No. 1 hvy. melting	.... $28.00
No. 2 hvy. melting	.... 24.00
No. 1 bundles	.... 27.00
No. 2 bundles	.... 22.00
No. 3 bundles	.... 18.00
Machine shop turn.	.... 7.00
Shoveling turnings	.... 10.00
Cast iron borings	.... 10.00
Elec. furn. 1 ft and under	.... 28.00
No. 1 RR. hvy. melting	.... 28.00
No. 1 cupola cast.	.... 43.00

Seattle

No. 1 hvy. melting	.... $27.00
No. 2 hvy. melting	.... 23.00
No. 1 bundles	.... 20.00
No. 2 bundles	.... 17.00
No. 3 bundles	.... 13.00
No. 1 cupola cast.	.... 35.00
Mixed yard cast.	.... 35.00

Hamilton, Ont.

No. 1 hvy. melting	.... $26.00
No. 2 hvy. melting	.... 23.00
No. 1 bundles	.... 26.00
No. 2 bundles	.... 23.00
Mixed steel scrap	.... 20.00
Bushelings	.... 21.00
Bush., new fact prep'd	.... 24.00
Bush., new fact unprep'd	.... 20.00
Short steel turnings	.... 13.00
Mixed bor. and turn.	.... 12.00
Rails, rerolling	.... 35.00
Cast scrap	$42.00 to 45.00

For Babies and Bridges

The Ninevites made wire in 800 B.C.—other hand-made specimens discovered date as far back as 1700 B.C. The Italians are said to have drawn wire before the tenth century, and in 1565, the draw plate was introduced into England, under permission granted by Queen Elizabeth.

It is not known when the first safety pin was used on a baby, but the first wire suspension bridge in the United States, and probably in the world, was thrown across the Schuylkill River at Philadelphia, in 1816.

Today, millions of miles of steel wire are used, not only for safety pins and suspension bridges, but also for countless other civilian and military requirements. To meet these needs, and for thousands of other steel products, a never-failing supply of scrap must be maintained.

For the purchase or sale of iron or steel scrap . . .

phone or write "Your Chicago Broker"

M. S.
KAPLAN
COMPANY

231 S. La Salle St., Chicago

Telephone ANdover 3-3900

Metal Use to Zoom In '55

Overall economic improvement will be reflected by more metal use . . . Military spending increase will help . . . Construction a big booster—*By R. L. Hatschek.*

◆ HAPPY NEW YEAR is forecast for the nonferrous metals. Major overall reason, of course, is that the economy will be moving at an accelerated pace in 1955 as compared to 1954.

Construction is expected to set a new alltime record, probably topping the 1954 high by some 7 pct. Automotive production is predicted at 5 pct higher. Use of electric power will establish a new alltime record. Electronics and appliance industries are confident of better business. And economic experts predict people will earn more money in '55—and spend more.

And on top of this solid outlook for civilian markets, defense spending will be greater.

Obviously this means a rise in metals consumption. Inventory corrections have largely been completed and, with the general tempo on the increase, the metal that is left in manufacturers' inventories no longer looks like too much.

How does this apply to the individual metals? Let's see:

ALUMINUM . . . Just coming out of a record production year, aluminum mill product shipments are already 23 pct higher than at the beginning of the year, says R. S. Reynolds, Jr., president of Reynolds Metals Co. Admittedly, shipments in early '54 months were lower than in the '53 boom. But the coming construction record (construction is the biggest user of aluminum), higher automotive production and more electric power used will keep aluminum swinging higher.

Particularly notable in the auto industry is the fact that more aluminum is being used per car—multiplying the demand factor of higher production. Swing toward more aluminum-clad buildings will be similar in effect. Much of the increased military spending will go for Air Force and missiles—meaning still more aluminum. And the government will continue to sock aluminum away in the strategic stockpile for the next few years at least.

Increase in primary production won't be as staggering as it was in 1953 and 1954—but there will be an increase provided no hitches develop. Only possible hitches are a strike, which is considered unlikely, and poor water conditions in the fall, which nobody can predict at this time. With new facilities coming in during the year, output for 1955 may well top the 1.5 million ton mark.

COPPER . . . Higher industrial rates for electricity, electronics, appliances (especially air conditioners), construction and automobiles assure a good year for copper. Add generally good outlook for the overall economy and brass seems assured a good year.

Consumers should be happier, too, as the shortage of second half 1954 is gradually fading out. Price structure is firm and a rise seems only prevented by policy of domestic producers to hold at current levels.

ZINC . . . Top consumers of zinc are galvanizing, diecasting and brass mills. Outlook for galvanizing is terrific with some steel industry continuous galvanizing lines sold out through first half of '55 already. Booming construction is largely at the root of this demand.

High rate of automotive production —biggest diecasting user—is assured at least until labor contracts run out at the end of May. Appliances also boom diecasting. And brass mills, as mentioned above, are also in for a good year.

Don't forget new look stockpiling which will probably continue at least through June and may be renewed for fiscal '56.

LEAD . . . Storage batteries, cable covering and gasoline additives are top consumers of lead. Thus the more cars there are on the roads, the better off lead is. Definitely worthwhile noting is that the automotive swing to 12-volt batteries is a healthy long-range trend. What makes it especially notable as we move into 1955 is that Chevrolet — top auto producer — has joined the swing.

Construction will keep business good for lead pigment people, too.

MAGNESIUM . . . After a worse than average slump in 1954, magnesium seems ready to stage a comeback. Though perhaps only partial in the coming year, the long-range trend seems very optimistic. Materials handling, truck bodies, printing and luggage are all promising to become more important consumers. Add rockets, missiles and radar increases for the military boost and the picture gets still brighter.

And the supply base was firmed up last week when Dow Chemical Co. renewed its lease on the Velasco reduction plant for 3 more years.

Daily Nonferrous Metal Prices

(Cents per lb except as noted)

	Dec. 29	Dec. 30	Dec. 31	Jan. 1	Jan. 3	Jan. 4
Copper, electro, Conn.	30.00	30.00	30.00	....	30.00	30.00
Copper, Lake, delivered	30.00	30.00	30.00	....	30.00	30.00
Tin, Straits, New York	87.375	87.75	88.00	....	88.00*	88.00*
Zinc, East St. Louis	11.50	11.50	11.50	....	11.50	11.50
Lead, St. Louis	14.80	14.80	14.80	....	14.80	14.80

Note: Quotations are going prices **Tentative*

Monthly Average Metal Prices

(Cents per lb except as noted)

Average prices of the major nonferrous metals in December, based on quotations appearing in THE IRON AGE, were as follows:

Electrolytic copper,		Zinc, E. St. Louis	11.50
Del'd Conn. Valley	30.00	Zinc, New York	12.00
Lake copper, delivered	30.00	Lead, St. Louis	14.80
Straits tin, New York	88.565	Lead, New York	15.00

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum

(Base 30,000 lb, f.o.b. ship. pt., frt. allowed)

Alloy	Flat Sheet 0.032 in.	Flat Sheet 0.081 in.	Flat Sheet 0.136-0.249 in.	Plate 0.250-3 000 in.
1100, 3003	38.1	36.1	34.9	34.5
5004	43.0	38.8	37.1	36.6
5052	45.7	40.9	39.2	38.3
2024-O, -OAL	48.4	39.8	38.3	38.4
7075-O, -OAL	50.8	48.1	45.8	45.8

Extruded Solid Shapes: Shape factors 1 to 4, 37.7¢ to 85.7¢; 12 to 14, 38.4¢ to $1.03; 24 to 26, 41.2¢ to $1.84; 36 to 38, 48.8¢ to $1.96.

Rod, Round: Rolled, 1.064-4.5 in. 1100-F, 42.5¢ to 39.1¢; cold finished, 0.375-3.499 in., 1100-F, 46.9¢ to 41.4¢.

Screw Machine Stock: Rounds, 2011-T3, ½-11/32 in., 62.5c to 49.1¢; ⅝-1½ in., 48.9¢ to 45.9¢; 1 9/16-3 in., 44.7¢ to 41.7¢. Base 4000 lb.

Drawn Wire: Coiled, 0.051-0.374 in., 1100, 44.1¢ to 34.8¢; 5052, 55.7¢ to 49.4¢; 2017-T4, 49.8¢ to 43.7¢; 6061-T4, 58.6¢ to 48.1¢.

Extruded Tubing: Rounds, 6063-T5, OD 1¼-2 in., 43.4¢ to 63.8¢; 2-4 in., 39.3¢ to 53.6¢; 4-6 in., 39.8¢ to 48.8¢; 6-9 in., 40.4¢ to 51.1¢.

Roofing Sheet: Flat, per sheet, 0.032-in. 42½ x 60-in., $2.918; x 96-in., $4.672; x 120-in., $5.841; x 144-in., $7.009. Coiled sheet, per lb, 0.019 in. x 29 in., 29.9¢.

Magnesium

(F.o.b. mill, freight allowed)

Sheet & Plate: FS1-O ¼ in., 56¢; 3/16 in., 47¢; ⅛ in., 60¢; 0.064 in., 73¢; 0.032 in., 94¢. Specification grade higher. Base 30,000 lb.

Extruded Round Rod: M, diam ⅜ to 0.311 in., 77¢; ½ to ¾ in., 60.5¢; 1¼ to 1.749 in., 56¢; 2½ to 5 in., 51.5¢. Other alloys higher. Base up to ¾ in. diam, 10,000 lb; ⅞ to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes: Rectangles: M. In weight per ft for perimeters less than size indicated: 0.10 to 0.11 lb, 3.5 in., 65.2¢; 0.22 to 0.25 lb, 5.9 in., 62.2¢; 0.50 to 0.59 lb, 8.6 in., 59.7¢; 1.8 to 2.59 lb, 19.5 in., 56.2¢; 4 to 6 lb, 28 in., 52¢. Other alloys higher. Base, in weight per ft of shape: Up to ⅓ lb, 10,000 lb; ½ to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: M, 0.049 to 0.057 in. wall thickness: OD ¼ to 5/16 in., $1.43; 5/16 to ⅜ in., $1.29; ½ to ⅝ in., 96¢; 1 to 2 in., 79¢; 0.165 to 0.219 in. wall: OD, ⅝ to ¾ in., 64¢; 1 to 2 in., 60¢; 3 to 4 in., 59¢. Other alloys higher. Base, OD: Up to 1½ in., 10,000 lb; 1¼ to 3 in., 20,000 lb; over 3 in., 30,000 lb.

Titanium

(10,000 lb base, f.o.b. mill)

Commercially pure and alloy grades: Sheets and strip, HR or CR, $15; Plate, HR, $12; Wire rolled and/or drawn, $11; Bar, HR or forged, $9; Forgings, $9.

Nickel, Monel, Inconel

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	102	78	99
Strip, CR	102	87	125
Rod, Bar, HR	87	69	93
Angles, HR	87	69	93
Plate, HR	97	82	95
Seamless Tube	132	108	153
Shot, Blocks		65	

Copper, Brass, Bronze

(Freight included on 500 lb)

	Sheet	Rods	Extruded Shapes
Copper	46.79		48.86
Copper, h-r	48.76	45.11	
Copper, drawn		46.36	
Low brass	44.95	44.89	
Yellow brass	42.27	42.21	
Red brass	45.89	45.83	
Naval brass	46.39	40.70	41.96
Leaded brass			39.73
Com. bronze	47.38	47.32	
Mang. bronze	50.11	44.25	45.81
Phos. bronze	67.31	67.81	
Munts metal	44.54	40.35	41.60
Ni silver, 10 pct	56.30		63.80

Beryllius copper, CR, 1.9% Be, Base 2000 lb, f.o.b.
Strip $1.68
Rod, bar, wire 1.65

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed 22.20
Aluminum pig 20.50
Antimony, American, Laredo, Tex. 28.50
Beryllium copper, per lb conta'd be $40.00
Beryllium aluminum 5% Be, Dollars per lb contained Be $72.75
Bismuth, ton lots $2.25
Cadmium, del'd $1.70
Cobalt, 97-99% (per lb) ..... $2.60 to $2.67
Copper, electro, Conn. Valley 30.00
Copper, Lake, delivered 30.00
Gold, U. S. Treas., per troy oz. $35.00
Indium, 99.8%, dollars per troy oz. $2.25
Iridium, dollars per troy oz. ..... $130 to $135
Lead, St. Louis 14.80
Lead, New York 15.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb, pig 27.00
ingot 27.75
Magnesium, sticks, 100 to 500 lb, ... 46.00 to 48.00
Mercury, dollars per 76-lb flask, f.o.b. New York ..... $322 to $324
Nickel electro, f.o.b. N. Y. warehouse 67.67
Nickel oxide sinter, at Copper Cliff, Ont., contained nickel 60.75
Palladium, dollars per troy oz. ..... $17 to $21
Platinum, dollars per troy oz. ..... $79 to $84
Silver, New York, cents per troy oz. 85.25
Tin, New York 88.00
Titanium, sponge, grade A-1 ..... $4.50
Zinc, East St. Louis 11.50
Zinc, New York 12.00
Zirconium copper, 50 pct $6.20

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5-5 ingot
No. 115 ..... 30.00
No. 120 ..... 29.50
No. 123 ..... 29.00
80-10-10 ingot
No. 305 ..... 34.00
No. 315 ..... 31.75
88-10-2 ingot
No. 210 ..... 42.75
No. 215 ..... 39.25
No. 245 ..... 34.75
Yellow ingot
No. 405 ..... 25.75
Manganese bronze
No. 421 ..... 27.75

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
0.30 copper, max. 24.00-24.25
0.60 copper, max. 23.75-24.00
Piston alloys (No. 122 type) 22.00-23.00
No. 12 alum. (No. 2 grade) ... 21.50-22.00
108 alloy 22.25-22.50
195 alloy 23.25-24.25
13 alloy (0.60 copper max.) ... 23.75-24.00
ASX-679 ..... 22.25-22.50

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—96-97½% 22.75-23.25
Grade 2—92-96% 22.00-22.25
Grade 3—90-92% 20.75-21.00
Grade 4—85-90% 19.75-20.50

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, 5000 lb lots)

Copper
Cast, oval, 15 in. or longer 44.92
Electrodeposited 39.78
Flat rolled 45.42
Brass, 80-20
Cast, oval, 15 in. or longer 43.515
Zinc, flat cast 20.25
Ball, anodes 18.50
Nickel, 99 pct plus
Cast 88.50
Cadmium $1.70
Silver 999 fine, rolled, 100 oz. lots per troy oz., f.o.b. Bridgeport, Conn. 94⅛

Chemicals

(Cents per lb, f.o.b. shipping points)

Copper cyanide, 100 lb drum 62.00
Copper sulphate, 99.5 crystals, bbl. 12.85
Nickel salts, single or double, 4-100 lb bags, frt. allowed 36.66
Nickel chloride, 375 lb drum 38.66
Silver cyanide, 100 oz. lots, per oz. 75⅛
Sodium cyanide, 96 pct domestic
200 lb drums 19.25
Zinc cyanide, 100 lb drum 54.50

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	26	25⅛
Yellow brass	19⅞	18⅛
Red brass	23	22⅛
Comm. bronze	22⅞	21⅛
Mang. bronze	18½	17⅝
Yellow brass rod ends	19⅝	....

Custom Smelters' Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 29
No. 2 copper wire 27½
Light copper 26
*Refinery brass ..... 25½—26
* Dry copper content.

Ingot Makers' Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 28⅛
No. 2 copper wire 27
Light copper 25⅛
No. 1 composition ..... 23½—24
No. 1 comp. turnings ..... 23 —23½
Rolled brass 18⅛
Brass pipe 19
Radiators ..... 19 —19⅛

Aluminum

Mixed old cast ..... 14 —14⅝
Mixed new clips ..... 14 —14⅝
Mixed turnings, dry ..... 14 —14⅝
Pots and pans ..... 14 —14⅝

Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

Copper and Brass

No. 1 heavy copper and wire 26½—27
No. 2 heavy copper and wire 25 —25½
Light copper ..... 23 —23½
New type shell cuttings ..... 23 —23½
Auto radiators (unsweated) .. 17⅜
No. 1 composition 21
No. 1 composition turnings .. 20⅛
Unlined red car boxes 17½
Cocks and faucets 17½
Mixed heavy yellow brass... 14
Old rolled brass 16½
Brass pipe 17⅛
New soft brass clippings 19
Brass rod ends 17
No. 1 brass rod turnings 16

Aluminum

Alum. pistons and struts .... 7⅛— 8⅛
Aluminum crankcases 11
1100 (2S) aluminum clippings 14⅛
Old sheet and utensils 11
Borings and turnings ..... 7 — 7⅛
Misc. cast aluminum 11
2024 (24S) clippings 12½

Zinc

New zinc clippings 7
Old zinc 5½
Zinc routings ..... 5½— 5⅝
Old die cast scrap ..... 5⅛— 5⅜

Nickel and Monel

Pure nickel clippings 57
Clean nickel turnings 40
Nickel anodes 57
Nickel rod ends 57
New Monel clippings 28
Clean Monel turnings 21
Old sheet Monel 26
Nickel silver clippings, mixed. 16½
Nickel silver turnings, mixed. 13⅛

Lead

Soft scrap lead ..... 12 —12½
Battery plates (dry) ..... 6½— 6⅝
Batteries, acid free ..... 4.35— 4.60

Magnesium

Segregated solids ..... 15½—19
Castings ..... 17½—18

Miscellaneous

Block tin ..... 75 —80
No. 1 pewter ..... 55 —60
No. 1 auto babbitt 43
Mixed common babbitt 14
Solder joints 17½
Siphon tops 45
Small foundry type ..... 16½—16⅝
Monotype ..... 15 —15⅛
Lino. and stereotype ..... 14½—14⅝
Electrotype ..... 12½—12⅝
Hand picked type shells ..... 10½—10⅝
Lino. and stereo. dross 6½
Electro dross 5

IRON AGE

STEEL PRICES

(Effective Jan. 4, 1956)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PILING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$86.00 *B3*		4.30 *B3*	6.45 *B3*	4.30 *B3*						
	Buffalo, N. Y.	$64.00 *B3*	$78.00 *B3, R3*	$86.00 *B3, R3*	5.075 *B3*	4.30 *B3*	6.45 *B3*	4.30 *B3*	4.05 *B3,R3*	5.75 *B3,R7*	6.15 *B3*	8.425 *B3*		
	Claymont, Del.													
	Coatesville, Pa.													
	Conshohocken, Pa.								4.10 *A2*	5.80 *A2*	6.15 *A2*			
	New Bedford, Mass.									6.20 *R6*				
	Johnstown, Pa.	$64.00 *B3*	$78.00 *B3*	$86.00 *B3*		4.30 *B3*	6.45 *B3*		4.05 *B3*					
	Fairless, Pa.													
	New Haven, Conn.									6.20 *D1* 6.50 *A5*				
	Phoenixville, Pa.					3.95 *P2*		3.95 *P2*						
	Sparrows Pt., Md.								4.05 *B3*	5.75 *B3*	6.15 *B3*	8.425 *B3*		
	Wallingford, Conn.									6.20 *W1*				
	Pawtucket, R. I. Worcester, Mass.									6.30 *N7* 6.60 *A5*				12.75 *A5* 12.80 *N7*
MIDDLE WEST	Alton, Ill.								4.225 *L1*					
	Ashland, Ky.								4.05 *A7*					
	Canton-Massillon, Dover, Ohio		$80.00 *R3*	$86.00 *R3, T5*										12.45 *G4*
	Chicago, Ill.	$64.00 *U1*	$78.00 *R3, U1,W8*	$86.00 *U1, W8,R3*	5.075 *U1*	4.25 *U1, W8*	6.40 *U1, Y1*	4.25 *U1*	4.05 *A1,N4 W8*	5.85 *A1*				
	Cleveland, Ohio									5.75 *A5,J3*		8.60 *A5*		12.45 *A5*
	Detroit, Mich.			$86.00 *R5*					4.15 *G3,M2*	5.85 *D1,D2, G3,M2,P11*	6.25 *G3*	8.70 *D2, G3*		
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana	$64.00 *U1*	$78.00 *U1*	$86.00 *U1, Y1*	5.075 *I3*	4.25 *I3, U1*	6.40 *U1, I3*		4.05 *I3, U1,Y1*	5.85 *I3*	6.15 *U1, I3,Y1*	8.60 *Y1*	6.70 *U1, Y1*	
	Sterling, Ill.								4.15 *N4*					
	Indianapolis, Ind.									5.90 *C5*				
	Newport, Ky.												6.70 *Y5*	
	Middletown, Ohio									5.75 *A7*				
	Niles, Warren, Ohio Sharon, Pa.								4.05 *S1,R3*	5.75 *S1,R3, T4*	6.15 *S1, R3*	8.60 *S1, R3*	6.70 *S1*	12.45 *S1*
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	$64.00 *U1, J3,*	$78.00 *J3, U1,C11*	$86.00 *U1, C11*	5.075 *U1*	4.25 *J3, U1*	6.40 *J3, U1*	4.25 *U1*	4.05 *S7,P6*	5.75 *B4,J3, S7*			6.70 *S9*	12.45 *S9*
	Portsmouth, Ohio								4.05 *P7*	5.75 *P7*				
	Weirton, Wheeling, Follansbee, W. Va.					4.25 *W3*			4.05 *W3*	5.75 *F3,W3*	6.15 *W3*	8.60 *W3*		
	Youngstown, Ohio		$78.00 *C10*	$86.00 *Y1, C10*		4.25 *Y1*	6.40 *Y1*		4.05 *U1,Y1*	5.75 *Y1,C5*	6.15 *U1, Y1*	8.60 *Y1*	6.70 *U1, Y1*	12.45 *C5*
WEST	Fontana, Cal.	$72.00 *K1*	$86.00 *K1*	$105.00 *K1*		4.90 *K1*	7.05 *K1*	5.25 *K1*	4.825 *K1*	7.05 *K1*	7.25 *K1*		8.10 *K1*	14.55 *K1*
	Geneva, Utah		$78.00 *C7*			4.25 *C7*	6.40 *C7*							
	Kansas City, Mo.					4.30 *S2*	6.45 *S2*		4.30 *S2*		6.40 *S2*		6.95 *S2*	
	Los Angeles, Torrance, Cal.		$87.50 *B2*	$106.00 *B2*		4.95 *B2, C7*	7.10 *B2*		4.90 *B2,C7*	7.80 *C1*				
	Minnequa, Colo.					4.70 *C6*			5.15 *C6*					
	Portland, Ore.					5.00 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$87.50 *B2*			4.90 *B2* 4.95 *P9*	7.05 *B2*		4.80 *B2,C7*					
	Seattle, Wash.		$91.50 *B2*			5.00 *B3*	7.15 *B2*		5.05 *B2, P12*					
SOUTH	Atlanta, Ga.								4.25 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$64.00 *T2*	$78.00 *T2*			4.25 *C16, R3,T2*	6.40 *T2*		4.05 *R3, T2,C16*		6.15 *T2*			
	Houston, Tex.		$83.00 *S2*	$91.00 *S2*		4.30 *S2*	6.45 *S2*		4.30 *S2*		6.40 *S2*		6.95 *S2*	

IRON AGE

STEEL PRICES

(Effective Jan. 4, 1955)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS									WIRE ROD	TINPLATE†		BLACK PLATE
		Hot-rolled 18 ga. & hvyr.	Cold-rolled	Galvanized 19 ga.	Enameling 12 ga.	Long Terne 18 ga.	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot-rolled 19 ga.		Coke* 1.25-lb. base box	Electro* 0.25-lb. base box	Hollowware Enameling 29 ga.
EAST	Bethlehem, Pa.													
	Buffalo, N. Y.	4.05 *B3*	4.95 *B3*				6.10 *B3*	7.50 *B3*			4.675 *W6*	† Special coated mfg. terne deduct 95¢ from 1.25-lb coke base box price. Can-making quality blackplate 55 to 128 lb. deduct $2.20 from 1.25-lb. coke base box. * COKES: 1.50-lb. add 25¢. ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.10. Differential 1.00 lb./0.25 lb. add 65¢.		
	Claymont, Del.													
	Coatesville, Pa.													
	Conshohocken, Pa.	4.10 *A2*	5.00 *A2*				6.15 *A2*							
	Harrisburg, Pa.													
	Hartford, Conn.													
	Johnstown, Pa.										4.675 *B3*			
	Fairless, Pa.	4.10 *U1*	5.00 *U1*				6.15 *U1*	7.55 *U1*				$8.90 *U1*	$7.60 *U1*	
	New Haven, Conn.													
	Phoenixville, Pa.													
	Sparrows Pt., Md.	4.05 *B3*	4.95 *B3*	5.45 *B3*			6.10 *B3*	7.50 *B3*	8.20 *B3*		4.775 *B3*	$8.90 *B3*	$7.60 *B3*	
	Worcester, Mass.										4.975 *A5*			
	Trenton, N. J.													
MIDDLE WEST	Alton, Ill.										4.85 *L1*			
	Ashland, Ky.	4.05 *A7*		5.45 *A7*	5.375 *A7*									
	Canton-Massillon, Dover, Ohio			5.45 *R1,R3*						5.175 *R1*				
	Chicago, Joliet, Ill.	4.05 *A1, W8*					6.10 *U1*				4.675 *A5, N4,R3*			
	Sterling, Ill.										4.775 *N4*			
	Cleveland, Ohio	4.05 *J3, R3*	4.95 *J3, R3*		5.375 *R3*		6.10 *J3, R3*	7.50 *J3, R3*			4.675 *A5*			
	Detroit, Mich.	4.15 *G3, M2*	5.05 *G3*				6.20 *G3*	7.60 *G3*						
	Newport, Ky.	4.05 *N5*		5.45 *N5*										
	Gary, Ind. Harbor, Indiana	4.05 *I3, U1,Y1*	4.95 *I3, U1,Y1*	5.45 *U1, I3*	5.375 *I3, U1*	5.85 *U1*	6.10 *U1, I3,Y1*	7.50 *U1, Y1*			4.675 *Y1*	$8.80 *I3, U1,Y1*	$7.50 *I3, U1,Y1*	6.20 *U1, Y1*
	Granite City, Ill.	4.25 *G2*	5.15 *G2*	5.65 *G2*	5.575 *G2*								$7.60 *G2*	6.30 *G2*
	Kokomo, Ind.	4.15 *C9*		5.55 *C9*						5.20 *C9*	4.775 *C9*			
	Mansfield, Ohio					5.85 *E2*				5.175 *E2*				
	Middletown, Ohio		4.95 *A7*		5.375 *A7*	5.85 *A7*								
	Niles, Ohio Sharon, Pa.	4.05 *S1,R3* 5.30 *N3*	4.95 *R3* 5.975 *N3*	5.45 *N3*	6.725 *N3*	5.85 *N3*	6.10 *S1,R3*	7.50 *R3*				$8.80 *R3*	$7.50 *R3*	
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	4.05 *J3, U1,P6*	4.95 *J3, U1,P6*	5.45 *U1*	5.375 *U1*		6.10 *J3, U1*	7.50 *J3, U1*	8.20 *U1*		4.675 *A5* 4.875 *P6*	$8.80 *J3, U1*	$7.50 *J3, U1*	6.20 *U1*
	Portsmouth, Ohio	4.05 *P7*	4.95 *P7*								4.675 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	4.05 *W3, W5*	4.95 *W3, W5,F3*	5.45 *W3 W5*		5.85 *W3, W5*	6.10 *W3*	7.50 *W3*				$8.80 *W3, W5*	$7.50 *W3, W5*	6.20 *F3, W5*
	Youngstown, Ohio	4.05 *U1, Y1*	4.95 *Y1*		5.375 *Y1*		6.10 *U1, Y1*	7.50 *Y1*			4.675 *Y1*			
WEST	Fontana, Cal.	4.825 *K1*	5.05 *K1*				6.875 *K1*	8.55 *K1*			5.475 *K1*			
	Geneva, Utah	4.15 *C7*												
	Kansas City, Mo.										4.925 *S2*			
	Los Angeles, Torrance, Cal.										5.475 *C7, B2*			
	Minnequa, Colo.										4.925 *C6*			
	San Francisco, Niles, Pittsburg, Cal.	4.75 *C7*	5.90 *C7*	6.20 *C7*							5.325 *C7*	$9.55 *C7*	$8.25 *C7*	
	Seattle, Wash.													
SOUTH	Atlanta, Ga.													
	Fairfield, Ala. Alabama City, Ala.	4.05 *R3, T2*	4.95 *T2*	5.45 *R3, T2*			6.10 *T2*			5.35 *R3*	4.675 *T2, R3*	$8.90 *T2*	$7.60 *T2*	
	Houston, Texas										4.925 *S2*			

IRON AGE

STEEL PRICES

(Effective Jan. 4, 1955)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.				5.075 *B3*	6.625 *B3*	6.45 *B3*					
	Buffalo, N. Y.	4.30 *B3,R3*	4.30 *B3,R3*	5.45 *B5*	5.075 *B3,R3*	6.625 *B3,B5*	6.45 *B3*	4.225 *B3,R3*			6.45 *B3*	5.75 *W6*
	Claymont, Del.							4.225 *C4*		5.50 *C4*		
	Centreville, Pa.							4.225 *L4*		5.00 *L4*		
	Conshohocken, Pa.							4.225 *A2*	5.275 *A2*		6.45 *A2*	
	Harrisburg, Pa.							3.975 *C3*	5.275 *C3*			
	Hartford, Conn.			5.90 *R3*		6.925 *R3*						
	Johnstown, Pa.	4.30 *B3*	4.30 *B3*		5.075 *B3*		6.45 *B3*	4.225 *B3*		5.00 *B3*	6.45 *B3*	5.75 *B3*
	Fairless, Pa.	4.45 *U1*	4.45 *U1*		5.225 *U1*							
	Newark, N. J.			5.85 *W10*		6.80 *W10*						
	Camden, N. J.			5.85 *P10*								
	Putnam, Conn.			5.95 *W10*								
	Sparrows Pt., Md.		4.36 *B1*					4.225 *B3*		5.00 *B3*	6.45 *B3*	5.85 *B3*
	Palmer, Worcester, Readville, Mansfield, Mass.			5.85 *W11* 5.95 *B5,C14*		6.925 *A5,B5*						6.95 *A5, W6*
MIDDLE WEST	Alton, Ill.	4.50 *L1*										5.925 *L1*
	Ashland,Newport,Ky.							4.225 *A7,N5*		5.00 *N5*		
	Canton-Massillon, Mansfield, Ohio	4.40 *R3*		5.40 *R2,R3*	5.075 *R3,T3*	6.625 *R2,R3, T3*		4.225 *E2*				
	Chicago, Joliet, Ill.	4.30 *U1, N4,W8,R3*	4.30 *N4,R3*	5.40 *A5,W10, W8,B5,L2*	5.075 *U1,R3, W8*	6.625 *A5,W8, W10,L2,B5*		4.225 *U1,W8, I3,A1,R3*	5.275 *U1*	5.00 *U1*	6.45 *U1*	5.75 *A5, R3,N4,W7*
	Cleveland, Ohio	4.30 *R3*	4.30 *R3*	5.40 *A5,C13*		6.625 *A5* 6.665 *C13*	6.45 *R3*	4.225 *J3,R3*	5.275 *J3*		6.45 *J3,R3*	5.75 *A5, C13*
	Detroit, Mich.	4.40 *G3* 4.45 *R5*		5.40 *R5* 5.60 *B5,P8* 5.85 *P5*	5.075 *R5* 5.175 *G3*	6.625 *R5* 6.825 *B5,P3, P8*	6.55 *G3*	4.325 *G3*			6.55 *G3*	
	Duluth, Minn.											5.75 *A5*
	Gary, Ind. Harbor, Crawfordsville	4.30 *I3, U1, Y1*	4.30 *I3, U1, Y1*	5.40 *M5,R3*	5.075 *I3, U1, Y1*	6.525 *M5* 6.625 *R3*	6.45 *U1,I3, Y1*	4.225 *I3, U1,Y1*	5.275 *I3*	5.00 *U1,Y1*	6.45 *U1,I3, Y1*	5.85 *M4*
	Granite City, Ill.							4.425 *G2*				
	Kokomo, Ind.											5.85 *C9*
	Sterling, Ill.	4.40 *N4*	4.40 *N4*									5.85 *N4*
	Niles, Ohio Sharon, Pa.	4.30 *R3*					6.45 *R3*	4.225 *S1,R3*		5.00 *S1*	6.45 *S1*	
	Pittsburgh, Pa. Midland, Pa.	4.30 *J3, U1, C11*	4.30 *J3, U1*	5.40 *A5,C8, C11,J3, W10,B4,R3*	5.075 *U1,C11*	6.625 *A5,C11, W10,C8,R3*	6.45 *J3, U1*	4.225 *J3, U1*	5.275 *U1*	5.00 *U1*	6.45 *J3, U1*	5.75 *A5,J3, P6*
	Portsmouth, Ohio											5.75 *P7*
	Weirton, Wheeling, Follansbee, W. Va.	4.30 *W3*						4.225 *W3, W5*				
	Youngstown, Ohio	4.30 *U1, Y1, C10,R3*	4.30 *U1, Y1, R3*	5.40 *F2,Y1, C10*	5.075 *U1, Y1, C10*	6.625 *Y1,C10* 6.665 *F2*	6.45 *U1, Y1*	4.225 *U1, Y1, R3*		5.00 *Y1*	6.45 *Y1*	5.75 *Y1*
WEST	Emeryville, Cal.	5.05 *J5*	5.05 *J5*									
	Fontana, Cal.	5.00 *K1*	5.00 *K1*		6.125 *K1*		7.70 *K1*	4.875 *K1*		6.45 *K1*	7.15 *K1*	
	Geneva, Utah							4.225 *C7*			6.45 *C7*	
	Kansas City, Mo.	4.55 *S2*	4.55 *S2*		5.225 *S2*		6.70 *S2*					6.00 *S2*
	Los Angeles, Torrance, Cal.	5.00 *B2,C7*	5.00 *B2,C7*	6.85 *R3*	6.125 *B2*		7.15 *B2*					6.70 *B2*
	Minnequa, Colo.	4.75 *C6*	4.75 *C6*					5.075 *C6*				6.00 *C6*
	Portland, Ore.	5.05 *O2*	5.05 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	5.00 *C7,P9* 5.05 *B2*	5.00 *C7,P9* 5.05 *B2*				7.20 *B2*					6.70 *C7*
	Seattle, Wash.	5.05 *B2,P12, N6*	5.05 *B2,P12*				7.20 *B2*	5.125 *B2*		6.70 *B2*	7.35 *B2*	
SOUTH	Atlanta, Ga.	4.50 *A8*	4.50 *A8*									5.95 *A8*
	Fairfield, Ala. City, Birmingham, Ala.	4.30 *T2,C16, R3*	4.30 *T2,C16, R3*				6.45 *T2*	4.225 *T2,R3*			6.45 *T2*	5.75 *R3, T2*
	Houston, Ft. Worth, Lone Star, Tex.	4.55 *S2*	4.55 *S2*		5.325 *S2*		6.70 *S2*	4.56 *L3* 4.275 *S2*		5.05 *S2*	6.50 *S2*	6.00 *S2*

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angell Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, O.
A8 Atlantic Steel Co., Atlanta, Ga.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C5 Cold Metal Products Co., Youngstown, O.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, New York
C12 Cumberland Steel Co., Cumberland, Md.
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham

D1 Detroit Steel Corp., Detroit
D2 Detroit Tube & Steel Div., Detroit
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimmons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G1 Globe Iron Co., Jackson, O.
G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid-States Steel & Wire Co., Crawfordsville, Ind.
M5 Monarch Steel Co., Inc., Hammond, Ind.
M6 Mystic Iron Works, Everett, Mass.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N3 Niles Rolling Mill Div., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N5 Newport Steel Corp., Newport, Ky.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P12 Pacific Steel Rolling Mills, Seattle

R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 Rotary Electric Steel Co., Detroit
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Corp., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw & Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Corp., Carnegie, Pa.

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T6 Tremont Nail Co., Wareham, Mass.
T7 Texas Steel Co., Fort Worth

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Co., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W11 Worcester Pressed Steel Co., Worcester, Mass

Y1 Youngstown Sheet & Tube Co., Youngstown

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $280 per net ton.

	BUTTWELD														SEAMLESS							
	⅛ In.		¼ In.		1 In.		1¼ In.		1½ In.		2 In.		2½–3 In.		2 In.		2½ In.		3 In.		3½–4 In.	
	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
STANDARD T. & C.																						
Sparrows Pt. *B3*	21.75	6.5	24.75	10.5	27.25	14.0	29.75	14.75	30.25	15.75	30.75	16.25	32.25	16.0	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown *R3*	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	.....	.....	.....	.....	.....	.....	.....	.....
Fontana *K1*	10.75	W4.5	13.75	W6.5	16.25	3.0	18.75	3.75	19.25	4.75	19.75	5.25	21.25	5.0	.....	.....	.....	.....	.....	.....	.....	.....
Pittsburgh *J3*	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	13.5	W1.50	17.5	0.75	20.0	3.25	21.5	4.75
Alton, Ill. *L1*	21.75	6.5	24.75	10.5	27.25	14.0	29.75	14.75	30.25	15.75	30.75	16.25	32.25	16.0	.....	.....	.....	.....	.....	.....	.....	.....
Sharon *M3*	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	.....	.....	.....	.....	.....	.....	.....	.....
Fairless *N2*	21.75	6.5	24.75	10.5	27.25	14.0	29.75	14.75	30.25	15.75	30.75	16.25	32.25	16.0	.....	.....	.....	.....	.....	.....	.....	.....
Pittsburgh *N1*	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	13.5	W1.50	17.5	0.75	20.0	3.25	21.5	4.75
Wheeling *W5*	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	.....	.....	.....	.....	.....	.....	.....	.....
Wheatland *W4*	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown *Y1*	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	13.5	W1.50	17.5	0.75	20.0	3.25	21.5	4.75
Indiana Harbor *Y1*	22.75	7.5	25.75	11.5	28.25	15.0	30.75	15.75	31.25	16.75	31.75	17.25	33.25	17.0	.....	.....	.....	.....	.....	.....	.....	.....
Lorain *N2*	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	13.5	W1.50	17.5	0.75	20.0	3.25	21.5	4.75
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	25.25	11.5	29.25	15.5	31.25	19.0	31.75	17.75	32.25	18.75	32.75	19.25	33.25	18.0	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown *R3*	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.25	35.25	20.0	.....	.....	.....	.....	.....	.....	.....	.....
Fairless *N2*	25.25	11.5	29.25	15.5	31.25	19.0	31.75	17.75	32.25	18.75	32.75	19.25	33.25	18.0	.....	.....	.....	.....	.....	.....	.....	.....
Fontana *K1*	14.25	.....	18.25	.....	20.25	.....	20.75	.....	21.25	.....	21.75	.....	22.25	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pittsburgh *J3*	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.25	35.25	20.0	14.0	.....	19.0	3.25	21.5	5.75	23.5	10.75
Alton, Ill. *L1*	25.25	11.5	29.25	15.5	31.25	19.0	31.75	17.75	32.25	18.25	32.75	19.25	33.25	18.0	.....	.....	.....	.....	.....	.....	.....	.....
Sharon *M3*	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.75	35.25	20.0	.....	.....	.....	.....	.....	.....	.....	.....
Pittsburgh *N1*	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.75	35.25	20.0	14.0	.....	19.0	3.25	21.5	5.75	23.5	10.75
Wheeling *W5*	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.75	35.25	20.0	.....	.....	.....	.....	.....	.....	.....	.....
Wheatland *W4*	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.75	35.25	20.0	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown *Y1*	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.75	35.25	20.0	14.0	.....	19.0	3.25	21.5	5.75	23.5	10.75
Indiana Harbor *Y1*	26.25	12.5	30.25	16.5	32.25	20.0	32.75	18.75	33.25	19.75	33.75	20.75	34.25	19.0	.....	.....	.....	.....	.....	.....	.....	.....
Lorain *N2*	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.75	35.25	20.0	14.0	.....	19.0	3.25	21.5	5.75	23.5	10.75

Threads only, buttweld and seamless 2½ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 4½ pt. higher discount. Buttweld jobbers discount, 5 pct.
Galvanized discounts based on zinc price in range of over 9¢ to 11¢ incl. per lb, East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt. e.g., zinc price range of over 11¢ to 13¢ would lower discounts; zinc price in range of over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 11.50¢ per lb.

Steel Prices

(Effective Jan. 4, 1955) *To identify producers, see Key on preceding page.*

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Treated
Bessemer *U1*	4.45	5.35	5.425				
So. Chicago *R3*				7.30			
Ensley *T2*	4.45	5.35					
Fairfield *T2*		5.35		7.30		5.275	
Gary *U1*	4.45	5.35				5.275	
Ind. Harbor *I3*	4.45		5.425	7.30		5.275	
Johnstown *B3*		5.35					
Joliet *U1*		5.35	5.425				
Kansas City *S2*				7.30			11.50
Lackawanna *B3*	4.45	5.35	5.425			5.275	
Minnequa *C6*	4.45	5.35	5.425	7.30		5.275	11.50
Pittsburgh *O1*					11.00		11.50
Pittsburgh *P5*					11.00		11.50
Pittsburgh *J3*				7.30			
Seattle *B2*				7.80		5.425	12.00
Steelton *B3*	4.45		5.425			5.275	
Struthers *Y1*				7.30			
Torrance *C7*						5.425	
Williamsport *S5*		5.35					
Youngstown *R3*				7.30			

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Fully Processed
Field	8.025	8.225	
Armature	8.50	8.75	9.25
Elect.	9.10	9.35	9.85
Motor	10.10	10.35	10.85
Dynamo	11.00	11.25	11.75
Trans. 72	11.95	12.20	12.70
Trans. 65	12.50	Grain Oriented	
Trans. 58	13.00	Trans. 80	16.00
Trans. 52	14.00	Trans. 73	17.10

Producing points: Beech Bottom (*W5*); Brackenridge (*A5*); Granite City (*G2*); Indiana Harbor (*I3*); Mansfield (*E2*); Newport, Ky. (*N9*); Niles, O. (*N3*); Vandergrift (*U1*); Warren, O. (*R3*); Zanesville (*A7*).

* Coils 75¢ higher.

CLAD STEEL

Stainless-carbon	Plate	Sheet
No. 304, 20 pct.		
Coatesville, Pa., *L4*	*33.20	
Washington, Pa., *J2*	.....	
Claymont, Del., *C6*	.....	
New Castle, Ind., *I2*	.....	32.50
Nickel-carbon		
10 pct. Coatesville, Pa., *L4*	39.50	
Inconel-carbon		
10 pct., Coatesville, Pa., *L4*	47.90	
Monel-carbon		
10 pct. Coatesville, Pa., *L4*	40.80	

* Includes annealing and pickling, sandblasting.

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails	Woven Wire Fence 9-15½ ga.	"T" Fence Posts	Single Loop Bale Ties	Galv. Barbed and Twisted Barbless Wire	Merch. Wire Ann'ld ¢/lb.	Merch. Wire* Galv. ¢/lb.
	Col	Col	Col	Col	Col		
Alabama City *R3*	137	146	...	155	159	6.90	7.30
Aliquippa, Pa. *J3*	137	149	...		156	6.90	7.425
Atlanta *A8*	139	151	...	157	164	7.00	7.525
Bartonville *K2*	139	151	...	157	164	7.00	7.55
Buffalo *W6*						6.90	7.30
Chicago, Ill. *N4*	137	149	...	155	162	6.90	7.45
Cleveland *A6*	142						
Cleveland *A5*						6.90	
Crawfordsville *M4*	139	151	...	157	159	7.00	7.55
Donora, Pa. *A5*	137	146	...	155	159	6.90	7.30
Duluth *A5*	137	146	150	155	159	6.90	7.30
Fairfield, Ala. *T2*	137	146	...	155	159	6.90	7.30
Galveston *D4*	139						
Houston *S2*	142	154	...	...	164	7.30	7.70
Johnstown, Pa. *B3*	137	149	...	...	162	6.90	7.45
Joliet, Ill. *A5*	137	146	...	155	159	6.90	7.30
Kokomo, Ind. *C9*	139	149	...	157	161	7.00	7.55
Los Angeles *B2*						7.85	
Kansas City *S2*	142	158	...	167	164	7.50	7.90
Minnequa *C6*	142	154	155	160	168	7.15	7.55
Menesson *P6*	137	151	...	...	163	6.90	7.45
Moline, Ill. *R3*	...	...	145	...	...	...	...
Pittsburg, Cal. *C7*	156	169	...	179	179	7.85	8.25
Portsmouth *P7*						6.90	7.90
Rankin, Pa. *A5*	137	146	...	...	159	6.90	7.30
So. Chicago *R3*	137	146	145	155	159	6.90	7.30
S. San Francisco *C6*	...	...	...	...	179	...	...
Sparrows Pt. *B3*	139	...	...	157	164	7.00	7.55
Struthers, O. *Y1*	...	...	...	...	...	6.90	7.55
Worcester *A5*	143	...	...	...	...	7.20	...
Williamsport, Pa. *S5*	...	...	150	...	...	...	...

Cut Nails, carloads, base $8.30 per keg at Conshohocken Pa. (*A2*).

* Alabama City and So. Chicago don't include zinc extra. Galvanized products computed with zinc at 11.0¢ per lb.

WAREHOUSES

Base price, f.o.b., dollars per 100 lb.

City	City Delivery Charge	Sheets: Hot-Rolled	Sheets: Cold-Rolled (15 gage)	Sheets: Galvanized (19 gage)	Strip: Hot-Rolled	Strip: Cold-Rolled	Plates	Shapes: Standard Structural	Bars: Hot-Rolled	Bars: Cold-Finished	Alloy Bars: Hot-Rolled A 4615 As rolled	Alloy Bars: Hot-Rolled A 4140 Annealed	Alloy Bars: Cold-Drawn A 4615 As rolled	Alloy Bars: Cold-Drawn A 4140 Annealed
Baltimore	$.20	6.32	7.51	7.71	6.99	.....	6.57	6.92	6.68	6.52	.....	.....	.....	.....
Birmingham	.15	6.35–6.50	7.35–8.10	8.25–9.00	6.60	9.60	6.65	6.85	6.50	9.00	.....	.....	.....	.....
Boston	.10	7.23	8.23	9.42–9.52	7.47	9.65–9.85	7.34–7.37	7.49	7.30	8.60–8.70	12.60–12.80	12.45–12.46	15.15	15.10
Buffalo	.20	6.35–6.40	7.40[2]	8.50–8.54	6.70–6.75	.....	6.65–6.76	6.70–6.77	6.50–6.55	7.85[2]–7.90	12.50	12.15[2]	14.85	14.75–14.80[2]
Chicago	.20	6.38	7.38	8.30	6.62	.....	6.52	6.69	6.51	7.50	12.25	11.90	14.60	14.55
Cincinnati	.15	6.49–6.53	7.37–7.42	8.25–8.30	6.86–6.91	.....	6.81–6.86	6.91	6.75–6.80	7.90–7.85	12.55	12.15–12.20	14.90	14.80–14.85
Cleveland	.20	6.38	7.38	8.45	6.72	.....	6.69	7.02	6.57	7.60	11.96	.....	.....	14.61
Denver		8.15	9.15	10.37	8.40	.....	8.10	8.15	8.30	9.27	.....	.....	.....	16.30
Detroit	.20	6.57	7.57	8.50–8.58	6.90	.....	6.80–6.85	7.16	6.79	7.77	12.45	12.10	14.80	14.75
Houston	.20	7.35	7.80	9.93	7.70	.....	7.35	7.80	7.70	9.50	.....	13.10	.....	.....
Kansas City	.20	7.05	8.05	8.95	7.29	.....	7.19	7.36	7.18	8.07–8.27	.....	12.27	.....	.....
Los Angeles	.20	7.50	9.35	9.95	7.65	.....	7.45	7.65	7.45	10.15	.....	13.20	.....	16.35
Memphis	.10	6.79	7.69	.....	6.90	.....	7.01	7.09	6.88	8.24	.....	.....	.....	.....
Milwaukee	.20	6.47	7.47	8.21–8.39	6.71	.....	6.61	6.86	6.60	7.69	12.34	11.99	14.69	14.64–14.84
New Orleans	.15	6.70	7.85	9.23	6.80	.....	6.90–6.95	7.05	6.80	8.70–10.70	.....	.....	.....	.....
New York	.10	6.97–6.98	7.70–8.46	8.79[1]–8.99	7.56–7.56	.....	7.10–7.27	7.13–7.35	7.30–7.37	8.63–8.73[2]	12.63	12.28	.....	14.93
Norfolk	.20	7.00	.....	.....	7.10	.....	7.10	7.10	7.10	8.60	.....	.....	.....	.....
Philadelphia	.10	6.19	7.29[3]	8.09[4]–8.23	6.96	.....	6.69	6.54	6.74	8.19[3]	.....	11.66–12.21	.....	14.86
Pittsburgh	.20	6.38	7.38	8.36–8.50	6.72–6.75	.....	6.52	6.69	6.51	7.55	12.25	11.90	14.60	14.55
Portland	.20	7.60	8.75	9.05	7.05	.....	7.45	7.50	7.55	10.95	.....	.....	.....	.....
Salt Lake City	.20	7.65	10.20	10.70	9.05	.....	7.70	7.70–8.85	8.80	10.95	.....	.....	.....	.....
San Francisco	.20	7.55	8.95	9.35–9.85	7.80	.....	7.40	7.50	7.35	10.05	.....	13.20	.....	16.35
Seattle	.00	8.10	9.80	10.15	8.20	.....	7.90	7.75	7.80	10.95	.....	13.65	.....	16.30
St. Louis	.20	6.62–6.67	7.67	8.54–8.59	6.91	.....	6.81	7.09	6.80	7.89	12.54	12.19	14.84–14.89	14.45–14.84
St. Paul	.15	7.03	8.03–8.50	8.96	7.25	.....	7.19	7.35	7.16	8.26	.....	12.56	.....	15.21

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets for quantity.

Exceptions: (1) 1500 to 9999 lb. (2) 1000 lb or over. (3) $.25 delivery. (4) 1000 to 1999 lb, $.25 delivery.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26–0.40	0.41–0.60	0.61–0.80	0.81–1.05	1.06–1.35
Bridgeport, New Britain, Conn. *S7*	5.75	8.05	9.00	11.15	13.85
Buffalo, N. Y. *R7*	5.75	8.05	9.00	10.95	13.25
Carnegie, Pa. *S9*	.....	8.05	9.00	11.15	13.85
Cleveland *A5*	5.75	8.05	9.00	11.15	13.85
Detroit *D1*	5.85	8.25	9.20	10.95	.....
Detroit *D2*	5.85	8.25	9.20	.....	.....
Harrison, N. J. *C11*	.....	.....	9.30	11.45	14.15
Indianapolis *C5*	6.00	8.20	9.00	11.15	13.85
New Castle, Pa. *B4*	5.75	8.05	9.00	10.95	.....
New Haven, Conn. *D1*	6.20	8.35	9.30	11.25	.....
Pawtucket, R. I. *N7*	6.30	8.35	9.30	11.45	14.15
Riverdale, Ill. *A1*	5.85	8.05	9.00	11.15	13.85
Sharon, Pa. *S1*	5.75	8.05	9.00	11.15	13.85
Trenton *R4*	.....	8.35	9.30	11.25	13.40
Wallingford *W1*	6.20	8.35	9.30	11.45	14.15
Warren, Ohio *T4*	5.75	8.05	9.00	11.15	13.85
Weirton, W. Va. *W3*	5.85	8.05	9.00	10.95	13.25
Worcester, Mass. *A5*	6.60	8.35	9.30	11.45	14.15
Youngstown *C5*	5.85	8.05	9.00	11.15	13.85

* Sold on Pittsburgh base.

BOILER TUBES

$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	Size B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
Babcock & Wilcox	2	13	28.33	33.97	27.48	32.95
	2½	12	38.15	45.74	37.00	44.38
	3	12	44.05	52.82	42.72	51.23
	3½	11	51.43	61.66	49.88	59.81
	4	10	68.29	81.88	66.24	79.42
National Tube	2	13	28.33	33.97	27.48	.....
	2½	12	38.15	45.74	37.00	.....
	3	12	44.05	52.82	42.72	.....
	3½	11	51.43	61.66	49.88	.....
	4	10	68.29	81.88	66.24	.....
Pittsburgh Steel	2	13	28.33	33.97	.....	.....
	2½	12	38.15	45.74	.....	.....
	3	12	44.05	52.82	.....	.....
	3½	11	51.43	61.66	.....	.....
	4	10	68.29	81.88	.....	.....

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb
18	4	1	—	—	$1.54
18	4	1	—	5	2.245
18	4	2	—	—	1.705
1.5	4	1.5	8	—	.90
6	4	2	6	—	1.29

High-carbon chromium	.73
Oil hardened manganese	.405
Special carbon	.37
Extra carbon	.31
Regular carbon	.26

Warehouse prices on and east of Mississippi are 3.5¢ per lb higher. West of Mississippi, 5.5¢ higher.

CAST IRON WATER PIPE

	Per Net Ton
6 to 24-in., del'd Chicago	$111.80 to $115.30
6 to 24 in., del'd N. Y.	115.00 to 116.00
6 to 24-in., Birmingham	98.00 to 102.50
6-in. and larger f.o.b. cars, San Francisco, Los Angeles, for all rail shipments; rail and water shipments less	$129.50 to $131.50

Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

LAKE SUPERIOR ORES

51.50% *Fe; natural content, delivered lower Lake ports. Prices effective July 1, 1953, to end of 1954 season.*

	Gross Ton
Openhearth lump	$11.15
Old range, bessemer	10.30
Old range, nonbessemer	10.15
Mesabi, bessemer	10.05
Mesabi, nonbessemer	9.90
High phosphorus	9.90

Prices based on upper Lakes rail freight rates, Lake vessel freight rates, handling and unloading charges, and taxes thereon, in effect on June 24, 1953. Increases or decreases after such date are for buyer's account.

COKE

	Net-Ton
Furnace, beehive (f.o.b. oven) Connellsville, Pa.	$14.25 to $14.50
Foundry, beehive (f.o.b. oven) Connellsville, Pa.	$16.50 to $17.00
Foundry, oven coke	
Buffalo, del'd	$28.03
Chicago, f.o.b.	24.50
Detroit, f.o.b.	25.50
New England, del'd	26.05
Seaboard, N. J., f.o.b.	24.00
Philadelphia, f.o.b.	23.00
Swedeland, Pa., f.o.b.	23.00
Painesville, Ohio, f.o.b.	25.50
Erie, Pa., f.o.b.	25.00
Cleveland, del'd	27.43
Cincinnati, del'd	26.56
St. Paul, f.o.b.	23.75
St. Louis, f.o.b.	26.00
Birmingham, f.o.b.	22.65
Lone Star, Tex., f.o.b.	18.50

ELECTRODES

Cents per lb, f.o.b. plant, threaded, with nipples, unboxed

GRAPHITE			CARBON		
Diam. (In.)	Length (In.)	Price	Diam. (In.)	Length (In.)	Price
24	84	29.50	40	100, 110	6.95
20	72	29.00	35	110	6.95
12 to 18	72	29.50	30	110	6.95
7 to 10	60	21.00	24	72 to 84	9.10
6	60	23.25	20	90	9.95
4	40	28.00	17	72	9.10
3	40	27.25	14	72	9.50
2½	30	28.00	10, 12	60	10.20
2	24	43.50	8	60	10.55

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Machine and Carriage Bolts

	Discount Less Case	Discount C.
½ in. & smaller x 4 in. & shorter	2	22
⅝ in. & smaller x 6 in. & shorter	+3	18
9/16 in. & ¾ in. x 6 in. & shorter	+4	17
⅞ in. & larger x 6 in. & shorter	+6	15
All diam. longer than 6 in.	+15	5
½ in. & smaller x 6 in. & shorter	+3	18
Lag, all diam. x 6 in. & shorter	6	25
Lag, all diam. longer than 6 in.	+2	19
Plow bolts	22	22

Nuts, H.P., C.P., reg. & hvy.

	Base Discount	Discount, Case or Keg
⅜" or smaller	55	64
⅞" to 1⅛" inclusive	58	66
1¼" to 1½" inclusive	60	67½

C.P. Hex regular & hvy.

All sizes	55	64

Hot Galv. Nuts (all types)

⅜" or smaller	38	50
⅞" to 1⅛" inclusive	41	52½

Finished, Semi-finished, Slotted or Castellated Nuts

All sizes	55	66

Rivets

	Base per 100 lb
½ in. & larger	$9.25
	Pct Off List
7/16 in. and smaller	37

Cap Screws

	Discount H.C. Heat Bright	Discount H.C. Heat Treated
New std. hex head, packaged		
⅝" x 6" and smaller and shorter	38	28
¼", ⅜", 1" x 6" and shorter	15	1
New std. hex head, bulk*		
⅝" x 6" and smaller and shorter	50	42
¼", ⅜", 1" x 6" and shorter	32	21

* Minimum quantity per item:
15,000 pieces ⅛", 5/16", ⅜" diam.
5,000 pieces 7/16", ½" 9/16" ⅝" diam.
2,000 pieces ¾", ⅞", 1" diam.

Machine Screws & Stove Bolts

	Quantity	Mach. Screws	Stove Bolts
Packaged, package list		33	43
Bulk, bulk list			
¼-in. diam. & under	15,000- 99,999	59	17
	100,000-199,999	63	25
	200,000 & over	67	33
5/16-in. diam. & larger	15,000- 49,999	59	17
	50,000- 99,999	63	25
	100,000 & over	67	33
All diam., over 3 in. long	5,000- 49,999	59	..
	50,000- 99,999	63	..
	100,000 & over	67	..

Machine Screw & Stove Bolt Nuts

	Quantity	Discount Hex	Discount Square
Packaged, package list		30	33
Bulk, bulk list			
⅜-in. diam. & smaller	15,000- 99,999	15	17
	100,000-199,999	23	25
	200,000 & over	31	33

REFRACTORIES

Fire Clay Brick — Carloads per 1000

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5.00)	$114.00
No. 1 Ohio	107.00
Sec. quality, Pa., Md., Ky., Mo., Ill.	107.00
No. 2 Ohio	98.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $1.50)	17.00

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$120.00
Childs, Hays, Pa.	125.00
Chicago District	130.00
Western Utah	.....
California	.....
Super Duty Hays, Pa., Athens, Tex., Windham	127.00
Curtner, Calif.	155.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	20.00
Silica cement, net ton, bulk, Hays, Pa.	23.00
Silica cement, net ton, bulk, Chicago District, Ensley, Ala.	21.00
Silica cement, net ton, bulk, Utah and Calif.	.....

Chrome Brick — Per net ton

Standard chemically bonded, Balt.	$86.00
Standard chemically bonded, Curtner, Calif.	96.25
Burned, Balt.	80.00

Magnesite Brick

Standard Baltimore	$109.00
Chemically bonded, Baltimore	97.50

Grain Magnesite — Bt. ⅝-in. grains

Domestic, f.o.b. Baltimore in bulk fines removed	$64.40
Domestic, f.o.b. Chewalah, Wash., Luning, Nev. in bulk	38.00
in sacks	43.75

Dead Burned Dolomite — Per net ton

F.o.b. bulk, producing points in: Pa., W. Va., Ohio	$14.50
Midwest	15.10
Missouri Valley	13.65

FLUORSPAR

Washed gravel, f.o.b. Rosiclaire, Ill.

Price, net ton; effective CaF, content	
72½%	$44.00
70% or more	42.50
60% or less	38.00

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.i.f. New York, ocean bags	11.25¢
Canadian sponge iron, Del'd in East	12.0¢
F.o.b. ship. pt., carloads	9.5¢
Domestic sponge iron, 98+% Fe, carload lots	9.5¢
Electrolytic iron, annealed, 99.5+% Fe	38.0¢
Electrolytic iron, unannealed, minus 325 mesh, 99+% Fe	53.5¢
Hydrogen reduced iron minus 300 mesh, 98+% Fe	63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 micron, 98%, 00.8+% Fe	83.0¢ to $1.48
Aluminum	31.5¢
Brass, 10 ton lots	29.50¢ to 36.50¢
Copper, electrolytic	43.50¢
Copper, reduced	42.50¢
Cadmium, 100-199 lb. 95¢ plus metal value	
Chromium, electrolytic, 99% min., and quality, del'd	$3.60
Lead	$1.00¢
Manganese	57.0¢
Molybdenum, 99%	$2.75
Nickel, unannealed	89.50¢
Nickel, annealed	96.50¢
Nickel, spherical, unannealed	93.50¢
Silicon	43.50¢
Solder powder	7.0¢ to 9.0¢ plus met. value
Stainless steel, 302	91.0¢
Stainless steel, 316	$1.10
Tin	14.04¢ plus metal value
Tungsten, 99% (65 mesh)	$4.05
Zinc, 10 ton lots	17.5¢ to 25.0¢

Ferroalloy Prices

(Effective Jan. 4, 1955)

Ferrochrome

Contract prices, cents per lb contained Cr, lump, bulk, carloads, del'd, 65-72% Cr, 2% max Si.

0.025% C	36.00	0.15% C ... 33.75
0.025% C, Simplex	34.50	0.20% C ... 33.50
0.06% C	34.50	0.50% C ... 33.25
0.10% C	34.00	1.00% C ... 33.00
		2.00% C ... 32.75
66-69% Cr, 4-6% C		24.75
62-66% Cr, 4-6% C, 6-9% Si		25.60

S. M. Ferrochrome

Contract prices, cents per pound, chromium contained, lump size, delivered.

High carbon type: 60.55% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carloads	25.85
Ton lots	28.00
Less ton lots	29.50

High Nitrogen Ferrochrome

Low-carbon type 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 3¢ for each additional 0.25% of N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10 max. C	$1.13
0.50% max. C	1.16
3 to 11% C	1.25

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.) Contract price, carloads, f.o.b. Niagara Falls, freight allowed, lump 4-in. x down, 24.75¢ per lb contained Cr plus 12.00¢ per lb contained Si. Bulk 3-in. x down, 25.05¢ per lb contained Cr plus 10.80¢ per lb contained Si. Bulk 1-in. x down, 25.25¢ per lb contained Cr plus 11.00¢ per lb contained Si.

Calcium-Silicon

Contract price per lb of alloy, lump, delivered.

30-33% Ca, 60-65% Si, 3.00 max. Fe.

Carloads	19.00
Ton lots	22.10
Less ton lots	23.60

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	20.00
Ton lots	22.30
Less ton lots	23.30

SMZ

Contract prices, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ¼ in. x 12 mesh.

Ton lots	17.50
Less ton lots	19.50

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 9-11% Mn, packed.

Carload lots	16.60
Ton lots	18.10
Less ton lots	19.35

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	17.50
Ton lots to carload packed	18.50
Less ton lots	20.00

Ferromanganese

Maximum contract base price, f.o.b., lump size, base content 74 to 76 pct Mn; Producing Point

	Cents per-lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	9.50
Clairton, Pa.	9.50
Sheridan, Pa.	9.50
Philo, Ohio	9.50

Add or subtract 0.1¢ for each 1 pct Mn above or below base content.

Briquets, delivered, 66 pct Mn:

Carloads, bulk	11.85
Ton lots packed	13.65

Spiegeleisen

Contract prices, per gross ton, lump, f.o.b. Palmerton, Pa.

Manganese	Silicon	
16 to 19%	3% max.	$84.00
19 to 21%	3% max.	86.00
21 to 23%	3% max.	88.50
23 to 25%	3% max.	91.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.

95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	45.00
Ton lots	43.50

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.

Carloads	30.00
Ton lots	32.00
250 to 1999 lb	34.00
Premium for hydrogen-removed metal	0.75

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn ..... 21.35¢

Low-Carb Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	32.00	32.85	35.05
0.07% max. C	29.95	31.80	33.80
0.15% max. C	28.45	30.30	31.50
0.30% max. C	26.95	28.80	30.00
0.50% max. C	26.45	28.30	29.50
0.75% max. C, 80-85% Mn, 5.0-7.0% Si	23.45	25.30	26.50

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢.

Carload bulk	11.00
Ton lots	12.65
Briquet contract basis carlots, bulk, delivered, per lb of briquet	12.45
Ton lots, packed	14.25

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $85.00 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $88.00. Add $1.00 per ton for each additional 0.50% Si up to and including 17%. Add $1.45 for each 0.50% Mn over 1%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, packed.

	Ton lots	Carloads
96% Si, 2% Fe	20.10	18.00
97% Si, 1% Fe	20.60	18.50

Silicon Briquets

Contract price, cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si briquets.

Carloads, bulk	6.55
Ton lots	8.35

Electric Ferrosilicon

Contract price, cents per lb contained Si, lump, bulk, carloads, delivered.

25% Si	20.00	75% Si	14.40
50% Si	12.00	85% Si	14.10
65% Si	13.50	90% Si	17.25

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

Ferrovanadium

35-55% contract basis, delivered, per pound, contained V.

Openhearth	$3.00-$3.10
Crucible	3.10- 3.20
High speed steel (Primos)	3.20- 3.25

Alsifer, 20% Al, 40% Si, 40% Fe,

Contract basis, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads	9.25¢
Ton lots	10.15

Calcium molybdate, 46.3-46.6%

f.o.b. Langeloth, Pa., per pound contained Mo $1.28

Ferrocolumbium, 50-60%, 2 in. x D contract basis, delivered per pound contained Cb.

Ton lots	$12.00
Less ton lots	12.05

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, contract basis, del'd, ton lots, 2-in. x D per lb cont'd Cb plus Ta.... $6.25

Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo.. $1.46

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $4.00 unitage, per gross ton $90.00

10 tons to less carload $110.00

Ferrotitanium, 40% regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.21

Ferrotitanium, 25% low carbon 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.50

Less ton lots $1.55

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload, per net ton $177.00

Ferrotungsten, ½ x down, packed, per pound contained W. ton lots, f.o.b. $3.80

Molybdic oxide, briquets, per lb contained Mo, f.o.b. Langeloth, Pa. $1.27

bags, f.o.b. Washington, Pa., Langeloth, Pa $1.24

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per lb.

Carload, bulk, lump	15.50¢
Ton lots, packed lump	16.75¢
Less ton lots, lump, packed	17.25¢

Vanadium Pentoxide, 86-89% V_2O_5 contract basis, per pound contained V_2O_5 ..... $1.23

Zirconium, contract basis, per lb of alloy

35-40%, f.o.b. freight allowed, ton lots	26.00¢
12-15%, del'd, lump, bulk-carloads	8.00¢

Boron Agents

Borosil, contract prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed. B, 214%, Si, 40-45%, per lb contained B.... $5.25

Bortam, f.o.b. Niagara Falls

Ton lots, per pound	45¢
Less ton lots, per pound	50¢

Corbortam, Ti 15-21%, B 1-2% Si 2-4%, Al 1-2%, C 4.5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.

Ton lots per pound ..... 10.00¢

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in., x D, Ton lots... $1.20

F.o.b. Wash., Pa.; 100 lb up

10 to 14% B	.85
14 to 19% B	1.20
19% min. B	1.50

Grainal, f.o.b. Bridgeville, Pa. freight allowed, 100 lb and over

No. 1	$1.00
No. 6	63¢
No. 79	58¢

Manganese-Boron, 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.

Ton lots	$1.46
Less ton lots	1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd, less ton lots $2.05

Silrax, Contract basis, delivered Ton lots ..... 45.00¢

PRICE AND PRODUCTION DATA 1955

Steel p. 340

Nonferrous p. 347

Pig Iron, Ore p. 350

Ferroalloys p. 353

Scrap p. 354

Index to this Section

CANADIAN IRON & STEEL

Ferroalloy Production 350
Pig Iron Production 350
Steel Capacity 341
Steel Production 341

FINANCIAL ANALYSIS, STEEL 343

FERROALLOYS

Ferromanganese 353
Ferrosilicon 353
Spiegeleisen 353

NONFERROUS PRICES

Aluminum Scrap, Cast 347
Antimony, Monthly 348
Brass Ingots, 85-5-5-5 347
Brass Scrap, No. 1 Comp. 347
Bronze Ingots, 88-10-2 347
Cadmium, Sticks, Bars 347
Cobalt, 97 to 99 Pct. 347
Copper Powder 349
Copper, Electrolytic 348
Lead 349
Magnesium, 99.8 Pct Plus 349
Nickel, Electrolytic 348
No. 1 Heavy Copper Scrap 347
Prime Western Zinc 349
Remelt Aluminum Ingot 347
Straits Tin 348
U. S. Aluminum Production 348
Zinc Powder 349

ORE, IRON

Analyses 352
Consumption 352
Shipments 352

PIG IRON PRICES

Birmingham Foundry 351
Buffalo Foundry 351
Chicago Foundry 351
Composite, Price 350
Foundry Coke 352
Furnace Coke 352
Granite City, Ill., Foundry 351
Valley Basic 351
Valley Foundry 351
Valley Malleable 351

PRODUCTION

Aluminum 348
Ingot Brass and Bronze 347
Magnesium 349
Pig Iron 350
Steel Capacity, Rates 341
Steel, Inc. Rates 341
Steel, Monthly 342
Steel Rates 340
World Steel 342

REFRACTORIES

Chrome Brick 353
Fire Clay Brick 353
Magnesite Brick 353
Silica Brick 353

SCRAP, IRON, STEEL

Chicago Heavy Melting 354
Composite Price 354
Cupola Cast at Cincinnati 354
Machinery Cast at Chicago 354
Philadelphia Heavy Melting 354
Pittsburgh Heavy Melting 354

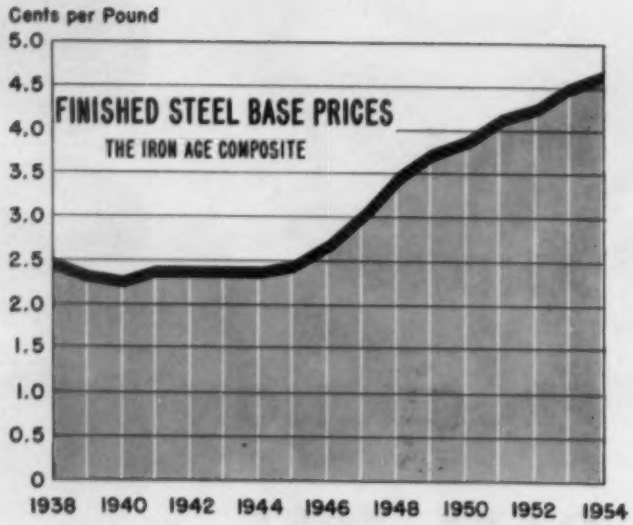
STEEL PRICES

Buttweld Steel Pipe 346
Cast Iron Water Pipe 346
Cold-Finished Steel Bars 346
Cold-Rolled Sheets 345
Cold-Rolled Strip 345
Composite, Steel 340
Galvanized Sheets 345
High Speed Tool Steel 345
Hot-Rolled Sheets 345
Hot-Rolled Strip 345
Iron Powder 349
Manufacturer's Bright Wire 346
Merchant Bars 346
Plates at Pittsburgh 345
Stainless Steel Sheets 346
Steel Rails 346
Structural Steel Shapes 346
Tinplate at Pittsburgh 345

Steel

Prices

Production



THE IRON AGE FINISHED STEEL COMPOSITE PRICE

Current Series, 1931 to 1954, Cents Per Pound

	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940*
Jan.	1.991	1.852	1.630	1.958	2.065	2.076	2.323	2.864	2.354	2.305
Feb.	1.986	1.843	1.612	1.958	2.065	2.065	2.323	2.861	2.354	2.305
March	1.982	1.852	1.606	1.958	2.065	2.056	2.632	2.676	2.354	2.305
April	1.974	1.862	1.700	2.007	2.065	2.062	2.664	2.676	2.354	2.267
May	1.960	1.891	1.770	2.154	2.065	2.062	2.664	2.569	2.308	2.305
June	1.961	1.888	1.786	2.154	2.065	2.067	2.664	2.613	2.283	2.316
July	1.940	1.892	1.841	2.107	2.065	2.139	2.664	2.350	2.283	2.305
Aug.	1.943	1.888	1.851	2.065	2.065	2.139	2.664	2.350	2.283	2.305
Sept.	1.943	1.883	1.879	2.065	2.065	1.148	2.664	2.357	2.283	2.305
Oct.	1.942	1.873	1.955	2.065	2.076	2.172	2.664	2.320	2.283	2.305
Nov.	1.937	1.866	1.947	2.065	2.076	2.172	2.664	2.354	2.268	2.305
Dec.	1.902	1.861	1.930	2.065	2.076	2.283	2.664	2.354	2.305	2.305
Average	1.957	1.873	1.851	2.061	2.068	2.118	2.638	2.459	2.311	2.302

	1945*	1946	1947	1948	1949	1950	1951	1952	1953	1954
Jan.	2.412	2.464	2.677	3.193	3.720	3.837	4.131	4.131	4.376	4.634
Feb.	2.427	2.555	2.684	3.215	3.719	3.837	4.131	4.131	4.376	4.634
March	2.432	2.719	2.684	3.241	3.715	3.837	4.131	4.131	4.376	4.634
April	2.433	2.719	2.684	3.241	3.708	3.837	4.131	4.131	4.376	4.634
May	2.436	2.719	2.684	3.214	3.706	3.837	4.131	4.131	4.393	4.634
June	2.464	2.719	2.684	3.211	3.708	3.837	4.131	4.131	4.517	4.634
July	2.464	2.719	2.914	3.293	3.705	3.837	4.131	4.188	4.634	4.789
Aug.	2.464	2.719	2.913	3.720	3.705	3.837	4.131	4.376	4.634	4.801
Sept.	2.464	2.719	2.913	3.720	3.705	3.837	4.131	4.376	4.634	4.801
Oct.	2.464	2.719	2.913	3.720	3.705	3.837	4.131	4.376	4.634	4.798
Nov.	2.464	2.719	2.913	3.720	3.705	3.837	4.131	4.376	4.633	4.797
Dec.	2.464	2.747	2.913	3.720	3.705	4.131	4.131	4.376	4.633	4.797
Average	2.449	2.686	3.014	3.434	3.713	3.862	4.131	4.237	4.518	4.716

* 1941-1944 inclusive: 2.386.

THE IRON AGE finished steel composite price is a weighted average of the base prices of 10 major steel products which account for the majority of finished steel shipments. It is weighted by the percentage that each of these products is to total finished steel shipments during the base period. With the base constant, the only changes in the composite from 1929 through 1940 or from 1941 through 1949 occur when one or more steel products prices were changed.

In the composite shown here there are two base periods. For the years 1931 through 1940 the base is finished steel shipments for 1929-1939 inclusive. For 1941 through 1950 the base is finished steel shipments for the 7 years 1937 to 1940 inclusive and 1946 to 1948 inclusive. Two base periods are used because of basic changes in the shipment pattern in the 20 years covered. In each case the products remain the same. They are hot-rolled bars, structural shapes, plates, rails, pipe, wire and hot- and cold-rolled sheets and strip. To eliminate variations due to nonferrous metals price fluctuations, no coated products are included.

Details of latest revisions which appear in current series may be found in The Iron Age, May 12, 1949, p. 139. This reference also gives a comparison of current series with former series.

STEEL INDUSTRY OPERATING RATES

U. S. Openhearth, Bessemer and Electric Furnace Ingots and Steel for Castings—Percent of Capacity

	1936	1937	1938	1939	1940	1941
Jan.	82.46	91.32	29.14	82.69	83.40	98.90
Feb.	84.61	94.26	31.59	84.93	70.00	98.60
Mar.	87.64	89.93	33.67	86.52	83.50	99.70
Apr.	70.09	90.24	33.70	90.97	61.20	97.60
May	69.66	88.79	36.26	46.51	71.60	98.70
June	70.86	74.47	23.33	83.57	84.50	98.90
July	67.71	70.37	23.25	82.85	83.00	93.40
Aug.	72.22	83.71	42.63	82.45	89.80	95.70
Sept.	74.16	76.10	46.03	72.68	90.60	96.40
Oct.	79.26	83.23	52.19	89.52	96.10	99.00
Nov.	77.06	36.16	61.74	93.46	96.60	98.30
Dec.	76.83	25.34	82.72	85.81	94.10	98.10
Average	68.45	72.33	39.80	84.83	82.10	97.40

	1942	1943	1944	1945	1946	1947
Jan.	94.80	96.80	98.70	88.50	49.60	93.20
Feb.	96.90	98.50	97.00	90.80	19.80	91.90
Mar.	96.20	100.00	98.80	95.00	83.30	94.40
Apr.	97.70	99.30	98.80	92.80	77.50	93.80
May	98.10	98.40	97.10	91.80	82.20	84.70
June	96.30	94.80	94.10	97.10	74.40	92.90
July	94.80	96.20	94.30	86.30	84.90	85.10
Aug.	95.40	98.30	94.10	70.70	86.90	92.20
Sept.	96.40	100.70	94.00	76.30	86.90	90.80
Oct.	100.00	101.20	95.60	68.00	89.00	97.70
Nov.	97.80	98.60	94.30	76.90	85.40	96.50
Dec.	96.60	94.20	92.60	74.60	73.90	95.40
Average	96.90	98.10	96.90	83.80	72.50	93.00

	1948	1949	1950	1951	1952	1953	1954†
Jan.	93.80	100.4	94.0	99.9	99.3	99.1	75.3
Feb.	93.80	101.6	89.2	97.2	100.7	99.1	74.3
Mar.	96.30	102.9	96.8	102.5	102.2	101.8	69.0
Apr.	90.40	98.0	100.6	103.1	99.7	98.7	68.1
May	94.80	93.0	101.4	102.8	98.2	100.1	70.7
June	93.80	82.2	99.6	101.0	10.4	97.2	72.0
July	88.70	71.0	94.8	98.3	17.7	93.1	62.9
Aug.	93.10	82.3	96.5	98.7	92.4	94.2	63.1
Sept.	96.10	83.6	99.4	101.2	101.9	92.1	66.7
Oct.	99.90	11.4	102.4	103.0	106.6	94.7	72.9
Nov.	100.50	83.4	97.0	102.6	105.9	99.9	78.9
Dec.	97.70	94.8	98.9	100.6	105.6	79.7	79.0
Average	94.10	81.1	96.9	100.9	85.8	94.9	71.0

* Estimated. † Preliminary.

Source: American Iron and Steel Institute.

Steel industry

Openhearth, bessemer and electric furnace steel capacity, production and rates . . . Canadian production.

COMPOSITE PRICE BY PERIODS

Period	Cents per Pound
Jan. 1, 1941 to Jan. 15, 1945	2.396
Jan. 16, 1945 to Mar. 5, 1945	2.427
Mar. 6, 1945 to May 28, 1945	2.433
May 29, 1945 to Feb. 18, 1946	2.464
Feb. 19, 1946 to Dec. 9, 1946	2.719
Dec. 10, 1946 to Dec. 16, 1946	2.734
Dec. 17, 1946 to Dec. 30, 1946	2.765
Dec. 31, 1946 to Jan. 6, 1947	2.848
Jan. 7, 1947 to July 28, 1947	2.884
July 29, 1947 to Feb. 16, 1948	3.193
Feb. 17, 1948 to May 3, 1948	3.241
May 4, 1948 to July 26, 1948	3.211
July 27, 1948 to Aug. 2, 1948	3.721
Aug. 3, 1948 to Feb. 14, 1949	3.720
Feb. 15, 1949 to Mar. 14, 1949	3.717
Mar. 15, 1949 to Mar. 28, 1949	3.714
Mar. 29, 1949 to Apr. 11, 1949	3.711
Apr. 12, 1949 to May 2, 1949	3.708
May 3, 1949 to Dec. 21, 1949	3.705
Dec. 22, 1949 to Dec. 28, 1949	3.636
Dec. 29, 1949 to Dec. 4, 1950	3.637
Dec. 5, 1950 to July 25, 1952	4.131
July 26, 1952 to May 8, 1953	4.376
May 9, 1953 to May 21, 1953	4.390
May 22, 1953 to June 16, 1953	4.417
June 17, 1953 to Nov. 14, 1953	4.634
Nov. 15, 1953 to Dec. 15, 1953	4.632
Dec. 16, 1953 to June 30, 1954	4.634
July 1, 1954 to July 2, 1954	4.635
July 3, 1954 to July 5, 1954	4.791
July 6, 1954 to Oct. 3, 1954	4.801
Oct. 4, 1954 to Nov. 9, 1954	4.798
Nov. 10, 1954 to Dec. 31, 1954	4.797

CANADIAN STEEL OUTPUT

Ingots and Steel for Castings, Net Tons

	Ingots	Castings	Total Steel Ingots and Castings
1929	1,332,801	80,058	1,382,959
1929	1,466,688	78,962	1,545,250
1930	1,072,321	60,830	1,133,151
1931	744,605	41,501	786,106
1932	349,843	25,864	375,807
1933	441,346	17,830	459,176
1934	827,041	23,116	850,157
1935	1,016,814	35,123	1,051,937
1936	1,211,334	38,337	1,249,671
1937	1,496,575	74,652	1,571,137
1938	1,238,070	56,638	1,294,714
1939	1,266,056	60,997	1,327,053
1940	2,177,973	77,899	2,255,872
1941	2,578,063	123,250	2,701,313
1942	2,942,921	178,440	3,121,361
1943	2,848,235	148,743	2,996,978
1944	2,878,407	146,003	3,024,410
1945	2,747,206	134,117	2,881,323
1946	2,253,437	81,194	2,334,631
1947	2,854,532	90,634	2,945,166
1948	3,088,027	112,629	3,201,656
1949	3,080,388	97,962	3,186,930
1950	3,298,088	86,063	3,381,131
1951	3,448,125	121,236	3,567,361
1952	3,578,106	122,037	3,700,143
1953	4,008,813	105,656	4,116,469
1954*	3,037,982	82,595	3,120,557

* Estimated.

CANADIAN STEEL CAPACITY

Ingot Capacity and Operating Rates

	Steel Ingot Capacity	Steel Ingot Output	Percent of Capacity
1937	2,346,000	1,496,575	63.7
1938	2,346,000	1,238,070	52.7
1939	2,346,000	1,266,056	53.9
1940	2,667,000	2,177,973	81.6
1941	2,904,000	2,578,063	88.8
1942	3,172,000	2,942,921	92.7
1943	3,257,500	2,848,235	87.4
1944	3,338,200	2,878,407	86.2
1945	3,358,600	2,787,206	81.7
1946	3,358,600	2,253,437	67.0
1947	3,245,000	2,854,532	87.9
1948	3,490,000	3,088,027	88.5
1949	3,596,000	3,080,388	84.1
1950	3,672,500	3,298,088	89.8
1951	3,630,900	3,448,125	94.9
1952	3,630,900	3,578,106	98.5
1953	4,302,800	4,008,813	93.1
1954*	4,657,800	3,037,982	65.2

* December estimated.

STEEL CACPACITY, PRODUCTION AND RATES

Ingots and Steel for Castings, Net Tons

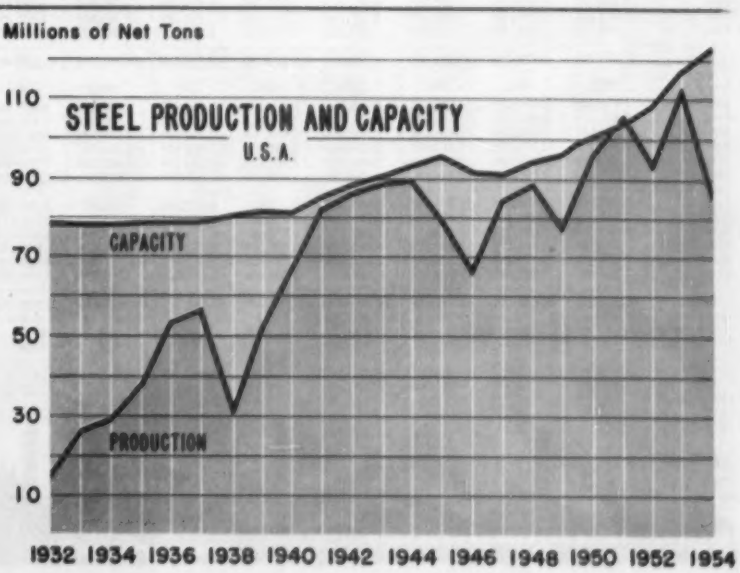
		Openhearth		Bessemer		Electric*		Total	
	Total Capacity	Production	Percent of Total Output	Production	Percent of Total Output	Production	Percent of Total Output	Production	Percent of Capacity
1954†	124,330,410	80,385,323	91.0	2,561,730	2.9	5,388,467	6.1	88,335,520	71.0
1953	117,547,470	100,473,823	90.0	3,885,706	3.5	7,290,191	6.5	111,609,719	94.9
1952	108,567,670	82,846,439	86.9	3,923,677	3.8	6,797,923	7.3	93,168,039	85.8
1951	104,229,650	93,166,618	88.6	4,890,948	4.6	7,142,384	6.8	105,199,949	100.9
1950	**	86,282,509	89.1	4,534,588	4.7	6,039,988	6.2	96,856,975	96.9
1949	98,129,930	70,246,803	90.1	3,946,656	5.1	3,782,717	4.8	77,976,176	81.1
1948	94,243,480	79,340,157	88.5	4,243,172	4.8	5,057,141	5.7	88,640,470	94.1
1947	91,241,250	76,873,783	90.5	4,232,643	5.0	3,787,785	4.5	84,894,071	93.0
1946	91,890,560	69,711,963	91.2	3,327,737	5.0	2,563,024	3.8	66,602,724	72.5
1945	98,505,290	71,939,602	90.3	4,309,318	5.4	3,456,728	4.3	79,701,648	83.8
1944	93,854,420	80,363,953	89.7	5,039,923	5.6	4,237,724	4.7	89,641,600	95.5
1943	90,589,190	76,621,804	88.5	5,625,492	6.3	4,589,216	5.2	88,836,512	98.1
1942	88,886,550	76,501,967	88.9	5,553,424	6.5	3,976,560	4.6	86,031,931	96.8
1941	85,188,150	74,388,619	89.8	5,578,071	6.7	2,871,560	3.5	82,839,250	97.3
1940	81,619,496	61,573,063	91.9	3,708,573	5.6	1,701,030	2.5	66,982,686	82.1
1939	81,828,956	48,408,800	91.7	3,358,916	6.4	1,029,998	1.9	52,796,714	64.5
1938	80,158,638	29,080,016	91.6	2,106,340	6.6	565,634	1.8	31,751,990	39.6
1937	78,148,374	81,824,979	91.6	3,883,918	6.8	948,048	1.7	60,636,945	72.6
1936	78,164,300	46,760,463	91.2	3,873,472	7.2	866,064	1.6	53,498,999	68.4
1935	78,451,930	34,401,280	90.1	3,175,235	8.3	607,190	1.6	38,183,705	48.7
1934	78,128,416	28,354,838	90.3	2,421,840	8.3	405,246	1.4	29,181,924	37.4
1933	76,614,403	22,827,473	87.7	2,720,246	10.5	472,610	1.8	26,020,229	33.1
1932	76,780,913	13,336,210	87.0	1,715,925	11.2	270,766	1.8	15,322,901	19.5
†931	77,257,803	25,210,714	88.8	3,388,259	11.8	461,980	1.6	29,058,961	37.6
1930	72,985,406	39,255,073	86.1	5,639,714	12.4	688,634	1.5	45,983,421	62.8
1929	71,436,516	54,155,233	85.7	7,977,210	12.6	1,073,048	1.7	63,205,490	88.5
1928	68,840,912	49,407,631	85.6	7,414,618	12.8	907,232	1.6	57,729,481	83.9
1927	67,236,117	42,638,635	84.7	6,934,734	13.8	786,138	1.5	50,327,407	74.9
1926	67,750,035	45,575,016	84.2	7,766,716	14.4	747,282	1.4	54,089,014	83.5

* Includes very small tonnages of crucible steel.

† Preliminary

** Jan. 1, 1950 to June 30, 1950 capacity was 99,392,800 net tons. Beginning July 1, 1950 capacity was revised to 100,563,800 net tons.

Source: American Iron & Steel Institute



Steel industry

Monthly data on U. S. production of openhearth, bessemer and electric furnace ingots . . . World steel . . .

WORLD STEEL PRODUCTION

Ingots and Steel for Castings, Thousands of Net Tons

Compiled by THE IRON AGE from the United Nations Bulletin of Statistics, Chambre Syndicate de la Siderurgie Francaise, British Iron and Steel Federation and the American Iron and Steel Institute.

Country	1954*	1953†	1952	1951	1950	1949	1948	1947	1946	1945	1944	1943
Australia	2,460	2,296	1,835	1,606	1,586	1,309	1,425	1,373	1,164	1,505	1,703	1,822
Austria	1,786	1,427	1,165	1,133	1,044	920	713	394	207	189	....	....
Belgium	5,385	4,897	5,621	5,890	4,196	4,242	4,318	3,181	2,508	805	670	1,634
Brazil	1,240	1,109	985	930	834	677	545	426	379	227	243	205
Canada	3,120	4,110	3,703	3,867	3,384	3,186	3,189	2,902	2,293	2,803	2,930	2,872
China	1,200	1,180	....	....	....	....	....	....	....	....	....	....
Czechoslovakia	5,100	4,883	3,944	3,851*	3,180*	2,786*	2,910*	2,529	1,643	1,045	2,778	2,831
France	11,335	11,023	11,879	10,842	9,537	10,086	7,904	6,338	4,888	1,822	3,408	5,851
Ger- Western	19,100	16,997	17,423	14,886	13,361[2]	10,080[2]	6,127[2]	4,739[2]	3,604[2]	8,500	24,461	23,706
many Eastern	2,725	2,666	2,087	1,711	....	....	....	....	....	....	....	....
Hungary	1,765	1,663	1,539	1,380*	1,100*	882*	794*	658	389	142	798	886
India	1,980	1,691	1,766	1,680	1,610	1,517	1,237	1,346	1,373	1,426	1,465	1,518
Italy	4,475	3,868	3,867	3,362	2,863	2,265	2,342	1,874	1,269	436	1,138	1,905
Japan	6,715	6,445	7,703	7,167	6,332	3,352	1,916	1,041	608	1,177	7,032	9,876
Luxembourg	3,070	2,931	3,309	3,391	2,702	2,507	2,705	1,900	1,425	291	1,389	2,388
Mexico	540	504	561	500	390	380	358	353	277	201	199	194
Netherlands	1,010	948	755	609	....	....	....	....	....	....	....	....
Poland	4,485	3,965	3,809	3,078	2,750*	2,539*	2,116*	1,731	1,344	546	755	670
Rumania	905	783	798	720*	....	....	....	....	....	....	....	....
Saar	3,075	2,969	3,112	2,809	2,092	1,936	1,922	780	317	....	....	....
South Africa	1,490	1,366	1,326	1,045	830	699	750	680	568	594	541	462
Spain	1,215	985	1,000	902	900	703	604	561	656	617	546	721
Sweden	2,085	1,969	1,636	1,696	1,567	1,511	1,270	1,311	1,335	1,327	1,320	1,338
United Kingdom	20,725	19,723	16,388	17,516	16,240	17,256	16,862	12,246	14,220	13,243	13,599	14,595
U.S.S.R.	44,900	41,800	38,029	34,500*	29,600*	23,600*	18,700*	14,700*	13,400*	12,300*	13,300	12,200
United States	89,325	111,610	93,168	105,200	96,836	77,978	88,894	84,894	66,603	79,702	89,642	88,837
Yugoslavia	690	566	488	470*	....	....	....	....	....	....	....	....
Others	2,460	2,290	1,824	....	....	....	....	....	....	....	....	....
Totals	245,199	250,798	229,423	229,945	204,348	173,386	167,107	147,156	120,345	125,896	171,905	184,481

* Estimated. † Revised. ‡ British, French and United States Zones.

WORLD STEEL DATA

Data in the table at left are based on an extensive Iron Age study. Assisting in the study were the Intelligence Dept. of the British Iron & Steel Federation, Chambre Syndicate de la Siderugie Francaise, United Nations, American Iron and Steel Institute and Iron Age correspondents throughout the world. Though based on the best available intelligence, the accuracy of Iron Curtain steel data is naturally not of the same order as that of the free world.

U. S. MONTHLY STEEL INGOT PRODUCTION

Openhearth, Bessemer and Electric Furnace Ingots and Steel for Castings, Net Tons; U. S. Only

	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941
Jan.	5,115,196	4,288,212	2,852,940	1,986,865	1,157,745	2,276,596	3,279,473	3,474,353	5,396,328	1,984,815	3,663,004	5,764,723	6,928,083
Feb.	4,920,348	4,578,761	2,892,154	1,981,421	1,221,864	2,621,472	3,169,909	3,379,867	5,050,824	1,942,795	3,448,129	4,825,787	6,237,900
March	5,790,878	4,829,571	3,466,268	1,627,030	1,022,675	3,190,040	3,273,910	3,610,438	5,970,247	2,253,884	3,929,387	4,388,183	7,131,641
April	5,625,610	4,664,182	3,141,887	1,429,648	1,531,613	3,346,922	3,017,177	4,484,782	5,801,640	2,196,413	3,431,606	4,100,474	6,758,949
May	6,008,784	4,920,520	2,607,388	1,277,302	2,290,236	3,870,202	3,009,425	4,614,829	5,894,268	2,681,169	3,372,636	4,967,782	7,053,238
June	5,573,076	3,879,960	2,416,078	1,036,102	2,919,687	3,487,612	2,580,771	4,543,898	4,787,710	1,898,848	3,606,729	5,657,443	6,660,730
July	5,513,546	3,316,654	2,143,351	915,738	3,607,288	1,997,879	2,891,240	4,473,940	5,212,832	2,298,677	3,948,639	5,724,825	6,821,682
Aug.	5,614,144	3,472,898	1,949,462	961,163	3,260,279	1,574,649	3,331,770	4,782,442	5,580,683	2,903,885	4,341,726	6,186,383	7,000,967
Sept.	5,146,744	3,223,706	1,754,617	1,126,092	2,598,370	1,446,551	3,227,576	4,744,641	4,907,592	3,029,738	4,881,601	6,056,246	6,819,706
Oct.	5,164,063	3,055,572	1,806,653	1,233,987	2,373,729	1,688,272	3,580,945	5,152,430	3,981,819	3,564,912	6,223,126	6,644,542	7,242,683
Nov.	4,002,368	2,510,620	1,607,315	1,171,710	1,731,930	1,635,068	3,580,687	4,941,014	2,464,793	4,072,676	6,292,322	6,460,107	6,909,987
Dec.	3,299,786	2,240,742	1,477,529	977,389	2,047,780	2,236,126	3,811,702	5,056,643	1,695,273	3,751,253	5,908,803	6,466,357	7,163,999
Total	61,736,509	44,599,050	28,606,379	5,123,207	25,724,196	29,101,329	38,183,705	53,449,085	58,535,899	31,751,983	52,797,783	66,981,862	82,927,557

	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954
Jan.	7,112,106	7,424,522	7,582,603	7,204,312	3,872,887	7,222,612	7,480,878	6,197,390	7,941,797	8,848,486	9,136,117	9,897,962	7,951,486
Feb.	6,512,535	6,824,604	7,194,009	6,662,786	1,392,682	6,430,401	6,948,017	5,493,942	6,903,032	7,770,407	8,657,210	8,932,779	7,083,237
March	7,382,111	7,674,578	7,826,257	7,705,929	6,506,784	7,318,974	7,616,770	6,401,796	7,497,822	7,076,630	9,404,191	10,168,096	7,289,600
April	7,121,291	7,373,703	7,593,686	2,289,867	5,901,195	7,061,842	6,224,487	7,796,165	6,224,604	8,045,979	7,991,142	9,545,536	6,970,037
May	7,362,578	7,549,001	7,702,576	7,449,667	4,072,820	7,335,014	7,560,642	7,586,990	8,564,207	9,100,155	8,204,586	9,997,880	7,472,738
June	7,015,302	7,039,353	7,234,257	6,840,522	5,625,773	6,977,714	7,285,249	6,504,656	8,143,230	8,662,348	1,639,491	9,404,479	7,363,634
July	7,144,958	7,407,576	7,948,367	6,965,571	5,618,083	6,578,085	7,075,517	5,784,031	8,662,922	8,864,495	1,026,958	9,275,673	6,827,887
Aug.	7,227,655	7,586,494	7,498,913	5,735,317	6,924,522	6,991,152	7,446,834	6,722,771	8,242,174	8,739,095	6,496,887	9,406,880	6,666,907
Sept.	7,067,519	7,514,230	7,235,111	5,962,475	6,555,586	6,797,457	7,424,044	6,067,938	8,204,997	8,660,357	9,062,105	8,863,429	6,607,463
Oct.	7,579,514	7,614,117	7,620,885	6,986,776	6,961,742	7,670,152	7,986,098	928,347	8,752,686	9,121,888	8,806,830	9,462,722	7,701,583
Nov.	7,179,812	7,371,578	7,278,719	6,200,468	6,487,771	7,242,427	7,707,550	4,223,129	8,023,393	8,798,352	8,438,886	8,690,052	6,874,000
Dec.	7,304,849	7,288,144	7,338,170	6,067,937	5,760,501	7,376,041	7,700,779	7,728,224	8,365,311	8,880,678	8,680,162	7,948,328	6,326,369
Total	86,829,921	88,836,300	89,641,575	79,701,624	68,902,706	84,894,071	88,649,470	77,978,176	96,836,675	105,199,946	93,186,375	111,600,719	88,335,529

† Preliminary. * Estimate.

Source: American Iron and Steel Institute.

Steel industry

Financial analysis of steel industry. Data cover 29 companies, represent 93 pct of U. S. ingot capacity . . .

FINANCIAL ANALYSIS OF THE STEEL INDUSTRY

For years 1949 through 1953. Data Cover 29 Companies Representing 93 Pct of U. S. Ingot Capacity

COMPANY	Year	Ingot Capacity Net Tons	Ingot Production Net Tons	Percent of Capacity Operated	Steel Shipments Net Tons	Net Sales and Operating Revenue	Provision for Federal Income Taxes	Net Income	Net Income Percent of Sales	Earnings Per Common Share	Invested Capital
U. S. Steel Corp.	1953	36,389,000	35,827,000	98.4	25,091,000	$3,861,034,728	$323,000,000	$222,087,940	5.8	$7.54	$2,319,132,239
	1952	34,642,000	29,436,000	85.0	21,133,000	3,137,387,336	117,000,000	143,667,746	4.6	4.84	2,197,124,774
	1951	34,643,000	34,323,000	101.3	24,626,000	3,524,121,226	356,000,000	184,388,787	5.2	6.10	2,150,858,480
	1950	33,900,000	31,457,000	98.2	22,635,000	2,956,406,146	234,000,000	215,464,142	7.3	7.29	2,070,950,448
	1949	32,000,000	25,867,000	82.8	18,212,000	2,301,688,689	126,000,000	166,908,629	7.2	6.39	1,963,857,294
Bethlehem Steel Corp.	1953	17,600,000	17,962,687	100.4	12,712,994	2,084,952,155	161,000,000	133,947,837	6.4	13.38	1,163,636,856
	1952	16,800,000	14,116,342	84.0	10,290,587	1,701,541,383	86,000,000	90,900,771	5.3	8.80	1,217,967,726
	1951	16,000,000	16,405,677	102.5	12,136,732	1,799,506,348	162,000,000	106,531,293	5.9	10.43	1,083,925,832
	1950	15,000,000	15,116,456	100.8	10,833,296	1,445,404,331	122,000,000	122,976,071	8.5	12.15	977,706,177
	1949	14,250,000	12,596,949	88.7	9,217,186	1,271,040,076	68,500,000	99,283,830	7.8	9.68	903,760,929
Republic Steel Corp.	1953	10,282,000	9,630,454	94.5	7,135,745	1,137,123,847	100,500,000	86,743,847	8.0	9.25	620,878,235
	1952	10,282,000	7,981,236	82.8	6,025,990	918,447,135	42,600,000	44,274,053	4.8	7.21	606,379,373
	1951	9,490,000	9,142,096	102.0	6,993,619	1,052,715,389	117,500,000	54,821,541	5.2	9.03	582,629,895
	1950	8,967,000	8,551,013	98.3	6,389,157	881,753,328	79,200,000	63,794,711	7.2	10.53	439,440,217
	1949	8,700,000	6,804,920	79.1	5,123,606	651,982,836	39,000,000	46,142,323	7.1	7.54	413,893,344
Jones & Laughlin Steel Corp.	1953	6,186,500	6,033,000	96.0	4,278,000	624,387,000	27,900,000	31,015,000	5.0	4.77	492,373,000
	1952	5,900,000	4,710,000	83.0	3,332,000	495,401,000	*5,656,000*	19,482,000	3.9	2.91	486,886,000
	1951	4,847,000	5,032,000	104.0	4,000,000	664,230,000	54,339,000	30,986,000	5.5	4.76	463,219,000
	1950	4,847,000	4,944,000	102.0	3,844,000	487,451,000	33,850,000	39,744,000	8.2	14.72	377,236,000
	1949	4,816,500	4,170,432	8.70	3,042,296	386,946,149	13,150,000	20,961,245	5.4	7.66	324,527,137
National Steel Corp.	1953	5,850,000				634,178,000	69,325,000	50,334,130	7.9	6.84	418,230,387
	1952	5,100,000				548,625,617	42,000,000	37,559,477	6.9	5.10	385,035,319
	1931	4,750,000				619,461,408	95,000,000	45,287,083	7.32	6.16	354,588,375
	1950	4,500,000				537,024,673	81,100,000	57,814,974	10.77	7.86	331,056,147
	1949	4,200,000				424,892,845	37,400,000	39,311,286	9.3	10.02	294,829,694
Youngstown Sheet & Tube Co.	1953	4,947,500	5,081,876	102.9	3,675,229	554,089,089	27,900,000	30,839,716	5.6	9.21	424,983,129
	1952	4,370,000	3,937,490	90.1	2,867,500	439,623,183	16,880,000	22,915,822	5.3	6.84	398,815,973
	1951	4,370,000	4,481,854	104.7	3,362,104	499,305,162	38,692,000	30,644,201	6.34	9.15	345,550,199
	1950	4,250,000	4,124,781	101.0	3,031,676	409,896,010	33,820,000	40,616,403	10.05	12.12	301,756,047
	1949	4,062,000	3,478,298	85.2	2,550,380	338,344,004	19,994,000	31,777,010	9.5	10.97	272,989,691
Armco Steel Corp.	1953	4,716,000	4,704,773	99.7	3,375,630	588,919,900	50,706,608	33,902,462	5.8	6.80	388,931,248
	1952	4,525,000	4,042,473	89.3	3,078,639	518,575,216	43,095,226	31,337,861	6.0	6.01	376,909,210
	1951	4,525,000	4,357,862	96.3	3,386,554	534,834,687	69,141,282	35,004,487	6.54	6.99	338,788,099
	1950	4,330,000	3,956,727	91.4	2,976,293	439,296,931	46,173,226	47,000,505	10.70	11.76	288,944,394
	1949	3,793,000	3,131,020	82.5	2,389,103	341,350,147	19,315,315	30,916,202	9.1	7.66	261,897,665
Inland Steel Co.	1953	4,500,000	4,513,076	100.3	3,712,000	579,509,058	39,379,000	33,867,184	5.9	6.90	344,188,324
	1952	3,750,000	3,307,253	84.7	3,307,253	460,451,935	13,117,000	23,756,218	5.2	4.85	337,631,507
	1951	3,750,000	3,837,268	102.3	3,366,698	521,449,655	53,520,000	34,398,585	6.6	7.02	290,662,261
	1950	3,750,000	3,675,707	102.8	3,406,564	461,376,600	41,224,700	38,015,676	8.2	7.76	275,631,279
	1949	3,400,000	3,019,665	88.8	2,715,396	347,640,710	18,938,000	26,013,707	7.2	6.11	256,783,208
Colorado Fuel & Iron Corp.	1953	2,311,785	2,130,481	92.2	1,948,414	348,635,674	14,572,400	8,031,224	3.2	3.09	166,460,029
	1952	2,024,000	1,892,485	93.5	1,575,967	196,757,164	8,461,500	5,761,965	2.9	2.64	133,736,055
	1951	1,822,884	1,615,246	106.1	1,708,855	191,444,412	18,936,500	10,382,228	5.42	5.06	86,882,288
	1950	1,472,000	1,198,531	81.4	1,115,504	112,642,939	2,704,300	4,409,226	3.91	3.30	82,383,166
	1949	1,472,000	1,446,653	98.3	1,348,136	138,344,200	6,069,200	10,162,919	7.4	8.46	77,408,439
Wheeling Steel Corp.	1953	1,860,000	1,797,419	96.6		219,509,774	14,036,000	12,456,311	5.7	7.49	205,965,477
	1952	1,860,000	1,464,965	78.8		180,285,277	7,475,000	10,960,780	6.1	6.43	201,707,487
	1951	1,860,000	1,874,238	100.8		229,012,621	23,662,000	17,292,960	7.59	10.96	192,703,514
	1950	1,800,000	1,636,475	94.7		186,723,442	17,342,000	18,314,517	9.81	11.59	169,623,186
	1949	1,836,000	1,227,600	79.9		143,419,446	5,819,000	7,986,285	5.5	10.63	158,195,962
Sharon Steel Corp.	1953	1,560,000	1,527,706	98.6	1,144,488	168,286,500	7,240,000	6,709,625	4.0	6.10	68,306,465
	1952	1,550,000	1,284,170	82.8	944,963	132,376,426	2,750,000	5,120,414	3.9	4.65	68,016,840
	1951	1,550,000	1,600,205	103.2	1,129,433	169,961,946	8,480,000	8,861,187	5.2	8.06	66,296,426
	1950	1,441,408	1,448,978	100.5	1,067,795	126,120,700	9,620,000	9,284,643	6.8	10.03	56,646,963
	1949	1,762,000	1,601,625	90.9	738,564	90,068,564	1,650,000	3,329,964	3.7	5.39	49,917,062
Kaiser Steel Corp.	1953	1,536,000	1,458,964	100.1	961,697	134,500,641	9,700,000	9,121,284	6.8	2.12	245,647,514
	1952	1,360,000	1,381,862	100.1	941,108	117,925,049	9,900,000	10,209,308	8.6	2.62	206,125,843
	1951	1,280,000	1,217,196	101.4	869,420	100,471,475	6,660,017	7,510,561	7.6	1.86	172,834,377
	1950	1,200,000	1,101,961	104.6	770,902	84,480,516	8,100,000	11,940,093	14.1	.....	136,767,959
Pittsburgh Steel Co.	1953	1,404,000	1,037,335	86.4	1,009,511	141,471,202	5,310,000	4,648,195	3.3	2.61	114,525,878
	1952	1,152,000	971,029	85.3	938,829	130,188,219	4,437,000	5,180,034	4.0	3.25	104,203,194
	1951	1,072,000	1,091,364	100.8	1,140,539	150,462,914	16,071,000	7,331,899	4.87	6.99	81,193,695
	1950	1,072,000	1,074,340	100.2	1,001,297	119,185,237	6,510,000	6,380,410	5.33	6.13	89,084,194
	1949	1,072,000	717,253	66.9	695,466	88,509,361	624,000	844,810	1.1	.04	84,186,177
Crucible Steel Co. of America	1953	1,351,400				232,276,349	6,986,979	5,109,982	2.2	5.26	122,320,246
	1952	1,350,700				180,296,483	5,877,506	5,394,520	3.0	6.13	124,260,177
	1951	1,198,960				202,866,727	16,699,421	8,363,225	4.1	11.69	106,675,766
	1950	1,153,455				147,807,941	8,200,523	6,311,254	4.27	9.73	96,639,334
	1949	1,112,964				99,393,229	351,827	1,382,764	1.4	.....	92,304,721
Barium Steel Corp.	1953	893,000	497,790	55.7		89,719,173	3,649,849	2,321,140	2.6	1.01	21,997,017
	1952	893,000	690,129	77.3		99,052,029	6,966,295	2,746,060	2.8	1.22	19,506,715
	1951	893,000	627,220	70.23		91,642,638	8,605,674	4,164,177	4.5	1.87	18,245,693
	1950	893,000	471,648	54.0		53,523,876	1,782,942	1,474,226	2.8	.66	15,034,143
	1949	406,000	188,486	43.9	131,414	33,885,546	809,463	711,482	2.1	.33	13,295,963

Italics denote loss or credit.

(Continued on next page)

Steel industry

Financial analysis of steel industry showing capacity, production, sales, earnings data, etc., by company . . .

FINANCIAL ANALYSIS (Continued)

COMPANY	Year	Ingot Capacity Net Tons	Ingot Production Net Tons	Percent of Capacity Operated	Steel Shipments Net Tons	Net Sales and Operating Revenue	Provision for Federal Income Taxes	Net Income	Net Income Percent of Sales	Earnings Per Common Share	Invested Capital
Allegheny Ludlum Steel Corp.	1953	864,200	660,619	76.8	537,341	242,061,546	11,676,000	7,791,287	3.2	4.40	79,561,900
	1952	869,200	569,921	64.1	467,838	190,091,165	2,900,000	5,940,324	3.1	3.37	75,439,053
	1951	817,200	817,068	100.0	676,960	229,080,224	20,190,000	8,834,149	3.86	5.40	72,240,773
	1950	832,360	701,809	85.5	617,710	177,961,693	10,250,000	9,814,891	5.52	7.97	60,701,579
	1949	832,360	382,813	57.8	297,635	105,863,359	1,200,000	1,967,324	1.9	1.15	52,659,400
Northwestern Steel & Wire Co.	1953	625,000	361,660	43.8	336,066	44,291,906	495,000	303,163	.7	.37	15,535,860
	1952	573,000	313,856	51.9	276,023	34,028,721	645,000	1,830,001	5.4	2.24	15,535,717
	1951	321,000	338,090	105.5	279,662	42,961,692	3,566,700	2,915,271	6.8	3.56	12,350,537
	1950	321,000	282,974	88.2	237,790	31,670,330	1,980,000	2,416,222	7.6	2.95	9,177,266
	1949	321,000	298,814	90.0	231,193	29,564,916	1,196,000	2,243,936	7.9	2.74	6,761,176
Granite City Steel Co.	1953	720,000	937,891	130.3	805,455	87,855,006	6,963,500	6,488,452	7.4	3.77	90,878,115
	1952	720,000	621,574	86.3	696,707	74,987,639	3,917,000	4,985,954	6.7	3.17	82,648,433
	1951	720,000	746,911	103.7	621,198	66,773,193	7,960,000	5,142,520	5.9	4.02	57,256,370
	1950	620,000	681,510	109.9	565,856	60,234,883	5,420,000	5,727,406	9.6	11.82	32,137,772
	1949	620,000	531,624	85.8	464,131	46,496,523	1,890,000	2,966,109	6.4	7.44	21,050,032
Newport Steel Corp.	1953	706,537	529,024	75.0	386,796	63,969,993	2,400,000	2,221,965	3.5	2.06	21,563,736
	1952	706,537	399,066	56.6	304,990	50,902,854	1,560,000	1,963,209	3.8	1.76	21,316,957
Lukens Steel Co.	1953	675,000	763,070	113.2	560,635	97,850,937	9,325,000	3,697,713	3.7	11.35	39,675,956
	1952	675,000	555,102	82.2	403,771	69,616,358	3,631,165	2,316,701	3.3	7.29	29,937,411
	1951	675,000	686,083	101.6	541,376	80,546,418	8,905,500	3,549,567	4.4	11.16	26,130,524
	1950	675,000	621,781	92.1	439,067	52,935,861	1,505,634	1,922,037	3.63	6.04	23,770,861
	1949	675,000	545,253	80.8	396,450	56,825,396	1,940,230	1,930,045	3.5	6.07	23,107,877
Detroit Steel Corp.	1953	660,000	529,044	80.2	583,421	93,391,589	6,612,624	5,230,289	5.6	2.16	39,082,957
	1952	660,000	529,432	80.2	609,437	87,421,483	4,673,235	4,276,666	4.9	1.80	36,631,367
	1951	660,000	644,786	97.7	780,940	113,747,043	21,812,229	10,514,896	9.2	6.87	33,726,306
	1950	660,000	653,863	99.1	805,689	92,948,234	6,615,770	8,943,140	9.6	7.54	25,562,996
	1949	660,000	511,647	77.5	329,396	49,744,901	3,012,000	4,985,424	9.8	3.87	21,750,173
Alan Wood Steel Co.	1953	625,000	596,334	95.7	442,537	69,756,645	2,457,000	3,213,690	5.4	4.63	31,561,852
	1952	625,000	658,449	105.4	473,963	69,479,849	2,475,000	2,251,073	3.7	3.17	30,122,666
	1951	625,000	623,232	99.7	465,231	88,764,602	4,192,000	2,303,720	3.9	3.32	29,481,967
	1950	560,000	485,907	86.3	337,415	44,964,826	1,745,000	2,546,902	5.7	3.92	29,668,629
	1949	560,000	381,710	68.4	270,863	35,695,466	1,480,000	2,255,940	6.3	3.76	27,548,014
Copperweld Steel Co.	1953	616,316				83,893,418	3,120,000	2,852,078	3.4	6.05	24,223,760
	1952	616,316				71,642,498	2,373,500	2,304,387	3.2	4.38	22,796,213
	1951	564,000				76,185,026	5,510,000	2,703,165	3.5	5.14	18,420,048
	1950	564,400				55,596,047	1,800,000	2,572,539	4.6	4.88	17,032,500
	1949	564,400				42,709,329	900,000	1,737,506	4.1	3.24	15,620,337
McLouth Steel Corp.	1953	570,700	528,734	91.2			11,560,000	5,241,501		4.41	94,027,386
	1952	570,700	491,726	84.8			9,600,000	4,227,954		4.44	36,035,896
	1951	420,000	448,478	107.0			11,542,000	6,161,039		6.41	32,161,821
Lone Star Steel Co.	1953	560,000	195,186		124,849	27,284,298	338,600	2,113,868	7.8	.80	84,294,641
	1952					18,738,525	760,980	2,452,072	13.0	.93	60,954,988
Laclede Steel Co.	1953	440,000	427,514	97.2	362,040	50,634,319	4,975,000	2,703,805	5.3	13.11	20,736,280
	1952	410,000	413,292	100.8	355,630	47,545,026	2,764,000	2,122,746	4.5	10.24	17,353,323
	1951	410,000	399,662	96.2	340,230	47,657,001	5,075,000	2,797,988	5.87	13.57	16,926,699
	1950	397,845	360,360	90.7	332,426	39,615,464	3,383,000	3,222,475	8.13	15.62	14,7.6,971
	1949	326,025	293,486	87.0	263,662	31,299,110	1,815,000	2,716,352	8.7	13.16	12,733,916
Keystone Steel & Wire Co.	1953	425,000	396,990	94.0	258,799	44,554,153	4,061,627	4,146,946	9.3	2.21	23,163,490
	1952	425,000	389,762	91.7	312,086	48,929,090	6,116,648	4,073,232	8.3	2.17	22,013,553
	1951	400,000	323,960	81.0	264,809	44,406,164	6,130,840	4,724,286	10.64	2.82	20,940,321
	1950	325,000	342,469	105.4	295,686	43,206,167	5,609,721	6,477,387	14.99	3.45	19,216,035
	1949	362,400	306,131	101.9	276,633	36,735,469	2,600,053	5,004,181	13.8	2.71	16,962,386
Rotary Electric Steel Co.	1953	425,000	296,776	70.5	240,120	44,150,335	4,924,060	2,262,367	5.1	6.86	18,474,951
	1952	425,000	323,988	76.2	249,259	37,212,163	2,841,000	1,843,064	5.0	6.38	14,390,919
	1951	425,000	372,148	87.6	279,852	40,993,056	5,015,000	2,482,974	6.1	8.55	13,919,093
	1950	425,000	392,764	90.1	307,433	31,103,586	1,910,000	2,160,170	6.9	11.16	10,866,109
	1949	430,000	247,380	58.9	213,976	16,965,512	955,000	1,287,063	7.6	6.7	10,083,290
Continental Steel Corp.	1953	384,000	362,048	91.9	282,625	36,761,804	1,700,000	1,693,163	4.4	3.20	20,612,499
	1952	384,000	325,136	82.5	244,169	35,716,970	1,800,000	1,477,030	4.1	2.94	20,111,151
	1951	384,000	363,484	92.3	290,501	39,666,970	4,150,000	1,530,371	3.84	3.05	16,486,435
	1950	363,705	372,138	94.5	292,662	36,426,123	3,220,000	2,660,153	7.30	5.31	15,963,694
	1949	384,000	239,736	65.9		22,505,562	795,000	636,716	2.8	1.27	14,978,249
GRAND TOTALS	1953	109,658,940	104,200,000	94.9	74,600,000	$12,266,361,088	$832,700,178	$600,920,244	5.6		$7,707,824,207
	1952	103,261,455	88,700,000	85.6	63,200,000	10,022,375,504	420,079,975	361,451,629	4.9		7,363,068,759
	1951	98,273,224	99,966,316	100.9	71,000,000	11,101,430,075	1,213,358,701	538,483,309	5.8		6,685,403,714
	1950	93,547,504	90,000,000	96.7	67,800,000	9,052,963,220	744,872,018	720,900,696	7.9		5,821,985,696
	1949	88,236,019	71,700,000	81.0	53,700,000	7,134,776,400	365,980,196	511,827,164	7.2		5,395,886,275

Italics denote loss or credit.

Steel industry

Prices: Hot and cold rolled sheets and strip, galvanized sheets, plate, tinplate and high speed tool steel.

COLD-ROLLED STRIP

At Pittsburgh, Cents Per Pound

	1938	1939	1940*	1946*	1947	1948
Jan.	3.20	2.95	2.80	2.80	3.20	3.55
Feb.	3.20	2.95	2.80	2.93	3.20	3.55
Mar.	3.20	2.95	2.80	3.05	3.20	3.55
Apr.	3.20	2.95	2.88	3.06	3.20	3.55
May	3.18	2.86	2.80	3.05	3.20	3.53
June	3.07	2.80	2.80	3.06	3.20	3.53
July	2.95	2.80	2.80	3.05	3.27	3.55
Aug.	2.95	2.80	2.80	3.05	3.55	4.00
Sept.	2.95	2.80	2.80	3.06	3.55	4.00
Oct.	2.83	2.80	2.80	3.05	3.55	4.00
Nov.	2.90	2.80	2.80	3.05	3.55	4.00
Dec.	2.85	2.80	2.89	3.17	3.55	4.00
Average	3.05	2.86	2.79	3.03	3.35	3.76

	1949	1950	1951	1952	1953	1954
Jan.	4.00	4.20	4.75	4.85	5.10	5.45
Feb.	4.00	4.21	4.75	4.85	5.10	5.45
Mar.	4.00	4.21	4.75	4.85	5.10	5.45
Apr.	4.00	4.21	4.75	4.85	5.10	5.45
May	4.00	4.21	4.75	4.85	5.10	5.45
June	4.00	4.21	4.75	4.85	5.25	5.45
July	4.00	4.21	4.75	4.74	5.45	5.73
Aug.	4.00	4.21	4.75	5.10	5.45	5.75
Sept.	4.00	4.21	4.75	5.10	5.45	5.75
Oct.	4.00	4.21	4.75	5.10	5.45	5.75
Nov.	4.00	4.21	4.75	5.10	5.45	5.75
Dec.	4.00	4.75	4.75	5.10	5.45	5.75
Average	4.01	4.25	4.75	4.85	5.29	5.60

* 1941-1945—2.80¢.

HOT-ROLLED SHEETS

At Pittsburgh, Cents Per Pound

	1939	1940*	1945*	1946	1947	1948
Jan.	2.15	2.10	2.10	2.20	2.50	2.80
Feb.	2.15	2.10	2.10	2.21	2.50	2.80
Mar.	2.15	2.10	2.16	2.43	2.50	2.80
Apr.	2.15	2.10	2.20	2.43	2.50	2.80
May	2.03	1.93	2.20	2.43	2.50	2.77
June	2.00	2.10	2.20	2.43	2.50	2.77
July	2.00	2.10	2.20	2.43	2.56	2.89
Aug.	2.00	2.10	2.20	2.43	2.80	3.25
Sept.	2.00	2.10	2.20	2.43	2.80	3.25
Oct.	2.00	2.10	2.20	2.43	2.80	3.25
Nov.	2.02	2.10	2.20	2.43	2.80	3.25
Dec.	2.10	2.10	2.20	2.49	2.80	3.25
Average	2.06	2.09	2.18	2.40	2.63	3.00

	1949	1950	1951	1952	1953	1954
Jan.	3.25	3.35	3.60	3.60	3.775	3.925
Feb.	3.25	3.35	3.60	3.60	3.775	3.925
Mar.	3.25	3.35	3.60	3.60	3.775	3.925
Apr.	3.25	3.35	3.60	3.60	3.775	3.925
May	3.25	3.35	3.60	3.60	3.775	3.925
June	3.25	3.35	3.60	3.60	3.838	3.925
July	3.25	3.35	3.60	3.635	3.925	4.042
Aug.	3.25	3.35	3.60	3.775	3.925	4.05
Sept.	3.25	3.35	3.60	3.775	3.925	4.05
Oct.	3.25	3.35	3.60	3.775	3.925	4.05
Nov.	3.25	3.35	3.60	3.775	3.925	4.05
Dec.	3.29	3.60	3.60	3.775	3.925	4.05
Average	3.26	3.37	3.60	3.676	3.866	3.967

* 1941-1944—2.10¢.

HIGH SPEED TOOL STEEL

18-4-1, Cents Per Pound

	1948	1949	1950	1951	1952	1953	1954
Jan.	82.0	90.5	100.0	116.6	150.5	157.57	152.50
Feb.	82.0	90.5	110.0	123.5	150.5	157.57	148.00
Mar.	82.0	90.5	100.0	123.5	150.5	157.57	148.00
Apr.	82.0	90.5	100.0	123.5	150.5	157.57	148.00
May	82.0	90.5	100.0	123.5	150.5	157.57	148.00
June	82.0	90.5	100.0	123.5	150.5	161.11	148.00
July	82.0	90.5	100.0	123.5	151.91	166.00	151.00
Aug.	90.5	90.5	100.0	150.5	157.57	166.00	154.00
Sept.	90.5	90.5	100.0	150.5	157.57	166.00	154.00
Oct.	90.5	90.5	100.0	150.5	157.57	166.00	154.00
Nov.	90.5	90.5	100.0	150.5	157.57	166.00	154.00
Dec.	90.5	90.5	110.0	150.5	157.57	166.00	154.00
Average	85.5	90.5	100.8	134.19	153.56	162.08	151.13

COLD-ROLLED SHEETS

At Pittsburgh, Cents Per Pound

	1938	1939	1940*	1946*	1947	1948
Jan.	3.55	3.20	3.05	3.06	3.20	3.55
Feb.	3.50	3.20	3.06	3.16	3.20	3.55
Mar.	3.45	3.20	3.06	3.275	3.20	3.55
Apr.	3.45	3.20	2.93	3.275	3.20	3.55
May	3.43	3.11	3.06	3.275	3.20	3.49
June	3.32	3.05	3.05	3.275	3.20	3.49
July	3.20	3.05	3.06	3.275	3.27	3.62
Aug.	3.20	3.05	3.05	3.275	3.55	4.00
Sept.	3.20	3.05	3.06	3.275	3.55	4.00
Oct.	3.06	3.05	3.06	3.275	3.55	4.00
Nov.	3.20	3.05	3.06	3.275	3.55	4.00
Dec.	3.20	3.05	3.06	3.215	3.55	4.00
Average	3.31	3.10	3.05	3.242	3.35	3.73

	1949	1950	1951	1952	1953	1954
Jan.	4.00	4.10	4.35	4.35	4.575	4.775
Feb.	4.00	4.10	4.35	4.35	4.575	4.775
Mar.	4.00	4.10	4.35	4.35	4.575	4.775
Apr.	4.00	4.10	4.35	4.35	4.575	4.775
May	4.00	4.10	4.35	4.35	4.575	4.775
June	4.00	4.10	4.35	4.35	4.600	4.775
July	4.00	4.10	4.35	4.395	4.775	4.939
Aug.	4.00	4.10	4.35	4.575	4.775	4.95
Sept.	4.00	4.10	4.35	4.575	4.775	4.95
Oct.	4.00	4.10	4.35	4.575	4.775	4.95
Nov.	4.00	4.10	4.35	4.575	4.775	4.95
Dec.	4.04	4.35	4.35	4.575	4.775	4.95
Average	4.00	4.12	4.35	4.449	4.682	4.862

* 1941-1945—3.06¢.

HOT-ROLLED STRIP

At Pittsburgh, Cents Per Pound

	1938	1939	1940†	1946*	1947	1948
Jan.	2.40	2.15	2.10	2.10	2.50	2.80
Feb.	2.40	2.15	2.10	2.23	2.50	2.80
Mar.	2.40	2.15	2.10	2.36	2.50	2.80
Apr.	2.40	2.15	1.98	2.35	2.50	2.80
May	2.38	2.06	2.10	2.35	2.50	2.80
June	2.27	2.00	2.10	2.35	2.50	2.80
July	2.15	2.00	2.10	2.35	2.56	2.90
Aug.	2.15	2.00	2.10	2.35	2.80	3.25
Sept.	2.15	2.00	2.10	2.35	2.80	3.25
Oct.	2.03	2.00	2.10	2.35	2.80	3.25
Nov.	2.15	2.02	2.10	2.35	2.80	3.25
Dec.	2.15	2.10	2.10	2.47	2.80	3.25
Average	2.25	2.06	2.09	2.33	2.63	3.03

	1949	1950	1951	1952	1953	1954
Jan.	3.25	3.25	3.50	3.50	3.725	3.925
Feb.	3.25	3.25	3.50	3.50	3.725	3.925
Mar.	3.25	3.25	3.50	3.50	3.725	3.925
Apr.	3.25	3.25	3.50	3.50	3.725	3.925
May	3.25	3.25	3.50	3.50	3.725	3.925
June	3.25	3.25	3.50	3.50	3.810	3.925
July	3.25	3.25	3.50	3.545	3.925	4.042
Aug.	3.25	3.25	3.50	3.725	3.925	4.05
Sept.	3.25	3.25	3.50	3.725	3.925	4.05
Oct.	3.25	3.25	3.50	3.725	3.925	4.05
Nov.	3.25	3.25	3.50	3.725	3.925	4.05
Dec.	3.25	3.50	3.50	3.725	3.925	4.05
Average	3.26	3.27	3.50	3.606	3.832	3.987

* Over 6 in.; add 0.10¢ for 6 in. and under from February through November 1946.
† 1941-1945—2.10¢.

GALVANIZED SHEETS

At Pittsburgh, Cents Per Pound

	1937	1938	1945†	1946	1947	1948
Jan.	3.40	3.50	3.50	3.70	3.55	3.95
Feb.	3.40	3.50	3.50	3.55	3.55	3.95
Mar.	3.72	3.50	3.62	4.05	3.55	3.95
Apr.	3.50	3.50	3.55	4.05	3.55	3.95
May	3.50	3.50	3.66	4.05	3.55	3.91
June	3.50	3.50	3.70	4.05	3.55	3.91
July	3.50	3.50	3.70	4.05	3.63	4.03
Aug.	3.50	3.50	3.70	4.05	3.95	4.40
Sept.	3.50	3.50	3.70	4.05	3.95	4.40
Oct.	3.50	3.45	3.70	4.05	3.95	4.40
Nov.	3.50	3.50	3.70	4.05	3.95	4.40
Dec.	3.50	3.50	3.70	*3.65	3.95	4.40
Average	3.73	3.64	3.65	3.99	3.72	4.13

	1949	1950	1951	1952	1953	1954
Jan.	4.40	4.40	4.80	4.80	5.075	5.275
Feb.	4.40	4.40	4.80	4.80	5.075	5.275
Mar.	4.40	4.40	4.80	4.80	5.075	5.275
Apr.	4.40	4.40	4.80	4.80	5.075	5.275
May	4.40	4.40	4.80	4.80	5.075	5.275
June	4.40	4.40	4.80	4.80	5.100	5.275
July	4.40	4.40	4.80	4.886	5.275	5.439
Aug.	4.40	4.40	4.80	5.075	5.275	5.45
Sept.	4.40	4.40	4.80	5.075	5.275	5.45
Oct.	4.40	4.40	4.80	5.075	5.275	5.45
Nov.	4.40	4.40	4.80	5.075	5.275	5.45
Dec.	4.40	4.80	4.80	5.075	5.275	5.45
Average	4.40	4.43	4.80	4.919	5.102	5.302

* Based on 10 gage since December 1946; 24 gage base up to that time.
† 1939-1944—3.50¢.

STEEL PLATES

At Pittsburgh, Cents Per Pound

	1937	1938*	1945*	1946	1947	1948
Jan.	2.05	2.25	2.10	2.25	2.65	2.95
Feb.	2.05	2.25	2.10	2.38	2.65	2.95
Mar.	2.21	2.25	2.20	2.50	2.65	2.95
Apr.	2.25	2.25	2.20	2.50	2.65	2.95
May	2.25	2.25	2.21	2.50	2.65	2.93
June	2.25	2.22	2.25	2.50	2.71	2.93
July	2.25	2.10	2.25	2.50	2.95	3.07
Aug.	2.25	2.10	2.25	2.50	2.95	3.50
Sept.	2.25	2.10	2.25	2.50	2.95	3.50
Oct.	2.25	2.10	2.25	2.50	2.95	3.50
Nov.	2.25	2.10	2.25	2.50	2.95	3.50
Dec.	2.25	2.10	2.25	2.50	2.95	3.50
Average	2.21	2.17	2.21	2.47	2.80	3.19

	1949	1950	1951	1952	1953	1954
Jan.	3.50	3.50	3.70	3.70	3.90	4.10
Feb.	3.50	3.50	3.70	3.70	3.90	4.10
Mar.	3.50	3.50	3.70	3.70	3.90	4.10
Apr.	3.50	3.50	3.70	3.70	3.90	4.10
May	3.40	3.50	3.70	3.70	3.90	4.10
June	3.40	3.50	3.70	3.70	3.98	4.10
July	3.40	3.50	3.70	3.74	4.10	4.217
Aug.	3.40	3.50	3.70	3.90	4.10	4.225
Sept.	3.40	3.50	3.70	3.90	4.10	4.225
Oct.	3.40	3.50	3.70	3.90	4.10	4.225
Nov.	3.40	3.50	3.70	3.90	4.10	4.225
Dec.	3.44	3.70	3.70	3.90	4.10	4.225
Average	3.43	3.52	3.70	3.78	4.01	4.162

* 1939-1944—2.10¢.

TINPLATE AT PITTSBURGH Dollars Per Base Box, 1.50-lb Coating

	1931	1933	1934	1936	1937	1938*	1947*
Jan.	$5.00	$4.25	$5.25	$5.25	$4.85	$5.35	$5.75
Feb.	5.00	4.25	5.25	5.25	4.85	5.35	5.75
Mar.	5.00	4.25	5.25	5.25	4.85	5.35	5.75
Apr.	5.00	4.25	5.25	5.25	5.35	5.35	5.75
May	5.00	4.25	5.25	5.25	5.35	5.35	5.75
June	5.00	4.25	5.25	5.25	5.35	5.35	5.75
July	5.00	4.25	5.25	5.25	5.35	5.35	5.75
Aug.	5.00	4.25	5.25	5.25	5.35	5.35	5.75
Sept.	5.00	4.65	5.25	5.25	5.35	5.35	5.75
Oct.	4.75	4.65	5.25	5.25	5.35	5.35	5.75
Nov.	4.75	4.65	5.25	5.25	5.35	5.10	5.75
Dec.	4.75	5.25	5.25	5.25	5.35	5.00	5.75
Average	4.94	4.43	5.25	5.25	5.22	5.31	5.75

* 1939-1948—$5.00.

	1948	1949	1950	1951	1952	1953	1954
Jan.	$6.90	$7.75	$7.50	$8.10	$8.70	$8.95	$8.95
Feb.	6.90	7.75	7.50	8.70	8.70	8.95	8.95
Mar.	6.90	7.75	7.50	8.70	8.70	8.95	8.95
Apr.	6.90	7.75	7.50	8.70	8.70	8.95	8.95
May	6.70	7.75	7.50	8.70	8.70	8.95	8.95
June	6.70	7.75	7.50	8.70	8.70	8.95	8.95
July	6.72	7.75	7.50	8.70	8.75	8.95	8.95
Aug.	6.90	7.75	7.50	8.70	8.95	8.95	8.95
Sept.	6.90	7.75	7.50	8.70	8.95	8.95	8.95
Oct.	6.90	7.75	7.50	8.70	8.95	8.95	8.95
Nov.	6.90	7.75	7.50	8.70	8.95	8.95	8.95
Dec.	6.90	7.75	7.50	8.70	8.95	8.95	8.95
Average	6.77	7.75	7.50	8.67	8.81	8.95	8.95

Steel industry

Prices: Hot-rolled and cold-finished bars, wire, structurals, rails, pipe, and stainless steel sheets . . .

MERCHANT BARS

At Pittsburgh, Cents Per Pound

	1938	1939*	1945*	1946	1947	1948
Jan.	2.45	2.25	2.15	2.25	2.60	2.90
Feb.	2.45	2.25	2.15	2.30	2.60	2.90
Mar.	2.45	2.25	2.15	2.60	2.60	2.90
Apr.	2.45	2.25	2.15	2.60	2.60	2.90
May	2.45	2.19	2.17	2.50	2.60	2.87
June	2.41	2.15	2.25	2.60	2.60	2.87
July	2.25	2.15	2.25	2.60	2.60	3.00
Aug.	2.25	2.15	2.25	2.60	2.90	3.45
Sept.	2.25	2.15	2.25	2.60	2.90	3.45
Oct.	2.25	2.15	2.25	2.60	2.90	3.45
Nov.	2.25	2.15	2.25	2.60	2.90	3.45
Dec.	2.25	2.15	2.25	2.56	2.90	3.45
Average	2.35	2.19	2.21	2.47	2.73	3.13

	1949	1950	1951	1952	1953	1954
Jan.	3.45	3.45	3.70	3.70	3.95	4.15
Feb.	3.45	3.45	3.70	3.70	3.95	4.15
Mar.	3.43	3.45	3.70	3.70	3.95	4.15
Apr.	3.35	3.45	3.70	3.70	3.95	4.15
May	3.35	3.45	3.70	3.70	3.95	4.15
June	3.35	3.45	3.70	3.70	4.04	4.15
July	3.35	3.45	3.70	3.75	4.15	4.29
Aug.	3.35	3.45	3.70	3.95	4.15	4.30
Sept.	3.35	3.45	3.70	3.95	4.15	4.30
Oct.	3.35	3.45	3.70	3.95	4.15	4.30
Nov.	3.35	3.45	3.70	3.95	4.15	4.30
Dec.	3.35	3.70	3.70	3.95	4.16	4.30
Average	3.37	3.47	3.70	3.79	4.06	4.22

* 1940-1944—2.15¢.

COLD-FINISHED STEEL BARS

At Pittsburgh, Cents Per Pound

	1938	1939*	1945*	1946	1947	1948
Jan.	2.90	2.70	2.65	2.75	3.20	3.55
Feb.	2.90	2.70	2.65	2.93	3.20	3.55
Mar.	2.85	2.70	2.65	3.10	3.20	3.55
Apr.	2.90	2.70	2.65	3.10	3.20	3.55
May	2.90	2.65	2.65	3.10	3.20	3.50
June	2.70	2.65	2.65	3.10	3.20	3.50
July	2.70	2.65	2.65	3.10	3.27	3.82
Aug.	2.70	2.65	2.73	3.10	3.55	3.98
Sept.	2.70	2.65	2.75	3.10	3.55	3.98
Oct.	2.70	2.65	2.75	3.10	3.55	3.98
Nov.	2.70	2.65	2.75	3.10	3.55	3.98
Dec.	2.70	2.65	2.75	3.10	3.55	3.98
Average	2.75	2.67	2.69	3.06	3.36	3.74

	1949	1950	1951	1952	1953	1954
Jan.	3.98	4.145	4.55	4.55	4.925	5.20
Feb.	3.98	4.145	4.55	4.55	4.925	5.20
Mar.	3.98	4.145	4.55	4.55	4.925	5.20
Apr.	3.98	4.145	4.55	4.55	4.925	5.20
May	3.98	4.145	4.55	4.55	4.925	5.20
June	3.98	4.145	4.55	4.55	5.041	5.20
July	3.98	4.145	4.55	4.625	5.20	5.39
Aug.	3.98	4.145	4.55	4.925	5.20	5.40
Sept.	3.98	4.145	4.55	4.925	5.20	5.40
Oct.	3.98	4.140	4.55	4.925	5.20	5.40
Nov.	3.98	4.15	4.55	4.925	5.20	5.40
Dec.	4.01	4.55	4.55	4.925	5.20	5.40
Average	3.98	4.179	4.55	4.712	5.072	5.30

* 1940-1944—2.65¢.

BUTTWELD STEEL PIPE

At Pittsburgh, Per Net Ton, Carload Lots

	1936	1937	1938*	1946*	1947	1948
Jan.	$66.40	$61.00	$71.00	$63.00	$79.00	$88.00
Feb.	64.00	61.00	71.00	66.00	79.00	91.50
Mar.	61.00	66.00	71.00	66.00	79.00	95.00
Apr.	61.00	71.00	71.00	66.00	79.00	95.00
May	61.00	71.00	71.00	66.00	79.00	94.00
June	61.00	71.00	71.00	66.00	79.00	93.00
July	61.00	71.00	63.00	66.00	79.00	95.00
Aug.	61.00	71.00	63.00	66.00	66.00	103.00
Sept.	61.00	71.00	63.00	66.00	66.00	103.00
Oct.	61.00	71.00	63.00	66.00	66.00	103.00
Nov.	61.00	71.00	63.00	66.00	66.00	103.00
Dec.	61.00	71.00	63.00	71.00	66.00	103.00
Average	62.01	69.17	67.00	66.42	72.75	97.21

	1949	1950	1951	1952	1953	1954
Jan.	$103.00	$106.00	$117.00	$117.00	$124.00	$136.50
Feb.	103.00	106.00	117.00	117.00	124.00	136.50
Mar.	103.00	106.00	117.00	117.00	124.00	136.50
Apr.	103.00	106.00	117.00	117.00	124.00	136.50
May	103.00	106.00	117.00	117.00	125.88	136.50
June	103.00	106.00	117.00	117.00	132.75	136.50
July	103.00	106.00	117.00	118.75	136.00	141.18
Aug.	103.00	106.00	117.00	124.00	136.50	141.50
Sept.	103.00	106.00	117.00	124.00	136.50	141.50
Oct.	103.00	106.00	117.00	124.00	136.50	141.50
Nov.	103.00	106.00	117.00	124.00	136.50	141.50
Dec.	106.00	117.00	117.00	124.00	136.50	141.50
Average	103.17	108.75	117.00	120.06	131.14	138.97

* 1938-1945—$63.00.
Computed from list discounts, for carload lots: 1-in. size, Standard, T. & C.

MANUFACTURER'S BRIGHT WIRE

At Pittsburgh, Cents Per Pound

	1937	1938*	1945*	1946	1947	1948
Jan.	2.80	2.80	2.60	2.75	3.30	3.55
Feb.	2.80	2.80	2.60	2.90	3.30	3.55
Mar.	2.84	2.80	2.60	3.05	3.30	3.55
Apr.	2.80	2.80	2.60	3.05	3.30	3.55
May	2.80	2.80	2.63	3.05	3.30	3.60
June	2.80	2.84	2.75	3.05	3.30	3.60
July	2.86	2.80	2.75	3.05	3.35	3.77
Aug.	2.80	2.80	2.75	3.05	3.55	4.33
Sept.	2.80	2.80	2.75	3.05	3.55	4.33
Oct.	2.80	2.80	2.75	3.05	3.55	4.33
Nov.	2.80	2.80	2.75	3.05	3.55	4.33
Dec.	2.80	2.80	2.75	3.10	3.55	4.33
Average	2.84	2.74	2.69	3.02	3.41	3.90

	1949	1950	1951	1952	1953	1954
Jan.	4.33	4.50	4.85	4.85	5.225	5.525
Feb.	4.33	4.50	4.85	4.85	5.225	5.525
Mar.	4.22	4.50	4.85	4.85	5.225	5.525
Apr.	4.15	4.50	4.85	4.85	5.225	5.525
May	4.15	4.50	4.85	4.85	5.225	5.525
June	4.15	4.50	4.85	4.85	5.352	5.525
July	4.15	4.50	4.85	4.925	5.525	5.735
Aug.	4.15	4.50	4.85	5.225	5.525	5.75
Sept.	4.15	4.50	4.85	5.225	5.525	5.75
Oct.	4.15	4.50	4.85	5.225	5.525	5.75
Nov.	4.15	4.50	4.85	5.225	5.525	5.75
Dec.	4.29	4.85	4.85	5.225	5.525	5.75
Average	4.20	4.53	4.85	5.012	5.386	5.636

* 1939-1944—2.60¢.

STRUCTURAL STEEL SHAPES

At Pittsburgh, Cents Per Pound

	1936	1937	1938*	1946*	1947	1948
Jan.	1.80	2.06	2.25	2.10	2.60	2.80
Feb.	1.80	2.06	2.25	2.23	2.60	2.80
Mar.	1.80	2.21	2.25	2.35	2.60	2.80
Apr.	1.80	2.25	2.25	2.35	2.60	2.80
May	1.80	2.25	2.25	2.35	2.60	2.75
June	1.80	2.25	2.22	2.35	2.60	2.75
July	1.90	2.25	2.10	2.35	2.60	2.85
Aug.	1.90	2.25	2.10	2.35	2.60	3.25
Sept.	1.90	2.25	2.10	2.35	2.60	3.25
Oct.	1.90	2.25	2.10	2.35	2.60	3.25
Nov.	1.90	2.25	2.10	2.35	2.60	3.25
Dec.	1.90	2.25	2.10	2.35	2.60	3.25
Average	1.85	2.21	2.17	2.32	2.63	3.00

	1949	1950	1951	1952	1953	1954
Jan.	3.25	3.40	3.65	3.65	3.85	4.10
Feb.	3.25	3.40	3.65	3.65	3.85	4.10
Mar.	3.25	3.40	3.65	3.65	3.85	4.10
Apr.	3.25	3.40	3.65	3.65	3.85	4.10
May	3.25	3.40	3.65	3.65	3.85	4.10
June	3.25	3.40	3.65	3.65	3.96	4.10
July	3.25	3.40	3.65	3.80	4.10	4.24
Aug.	3.25	3.40	3.65	3.65	4.10	4.25
Sept.	3.25	3.40	3.65	3.65	4.10	4.25
Oct.	3.25	3.40	3.65	3.65	4.10	4.25
Nov.	3.25	3.40	3.65	3.65	4.10	4.25
Dec.	3.31	3.65	3.65	3.65	4.10	4.25
Average	3.26	3.42	3.65	3.74	3.98	4.17

* 1939-1945—2.10¢.

CAST IRON WATER PIPE

At New York, Net Ton, 6-in. and Larger

	1937	1938	1939*	1946*	1947	1948
Jan.	$48.00	$53.00	$48.00	$57.20	$73.00	$80.10
Feb.	48.00	53.00	48.00	57.20	73.75	80.10
Mar.	51.50	53.00	48.00	60.20	78.80	80.10
Apr.	53.00	53.00	48.00	62.20	79.80	80.10
May	53.00	53.00	48.00	62.20	79.80	92.34
June	53.00	52.29	49.80	62.20	79.80	96.50
July	53.00	49.00	49.80	68.60	80.50	96.50
Aug.	53.00	49.00	49.80	68.60	83.30	103.66
Sept.	53.00	49.00	49.00	68.60	83.30	105.95
Oct.	53.00	48.00	52.20	68.60	83.96	105.95
Nov.	53.00	49.00	52.20	68.60	84.10	105.95
Dec.	53.00	48.00	52.20	73.60	84.10	105.95
Average	52.00	50.93	49.80	65.23	80.25	97.37

	1949	1950	1951	1952	1953	1954
Jan.	$105.95	$94.95	$105.00	$109.00	$114.00	$115.50
Feb.	105.95	92.36	109.00	109.00	114.00	115.50
Mar.	105.95	91.50	109.00	109.00	114.00	115.50
Apr.	103.88	91.50	109.00	109.00	114.00	115.50
May	94.95	91.50	109.00	109.00	114.00	115.50
June	94.50	91.50	109.00	109.00	114.00	115.50
July	94.95	91.50	109.00	109.00	115.00	115.50
Aug.	94.95	91.50	109.00	109.00	115.50	115.50
Sept.	94.95	91.50	109.00	111.50	115.50	115.50
Oct.	94.95	96.00	109.00	114.00	115.50	115.50
Nov.	94.95	96.00	109.00	114.00	115.50	115.50
Dec.	94.95	96.00	109.00	114.00	115.50	115.50
Average	98.45	92.98	108.67	110.46	114.75	115.50

* 1940-1945—$52.20.

STEEL RAILS AT PITTSBURGH. No. 1 OH

Including Prices by Months and Yearly Averages in Dollars Per 100 lb*

	1934	1936	1937	1938†	1945†	1946	1947
Jan.	$36.37	$36.37	$39.00	$42.50	$40.00	$43.00	$2.50
Feb.	36.37	36.37	39.00	42.50	40.00	*43.10	2.60
Mar.	36.37	36.37	41.00	42.50	42.25	43.30	2.60
Apr.	36.37	36.37	42.00	42.50	43.00	43.30	2.60
May	36.37	36.37	42.50	42.50	43.00	43.30	2.60
June	36.37	36.37	42.50	42.50	43.00	43.30	2.60
July	36.37	36.37	42.50	42.50	43.00	43.30	2.60
Aug.	36.37	36.37	42.50	42.50	43.00	43.30	2.75
Sept.	36.37	36.37	42.50	41.25	43.00	43.30	2.75
Oct.	36.37	36.37	42.50	40.00	43.00	43.30	2.75
Nov.	36.37	36.37	42.50	40.00	43.00	43.30	2.75
Dec.	36.37	36.00	42.50	40.00	43.00	47.36	2.75
Average	36.37	36.30	41.58	41.77	42.44	43.67	2.60

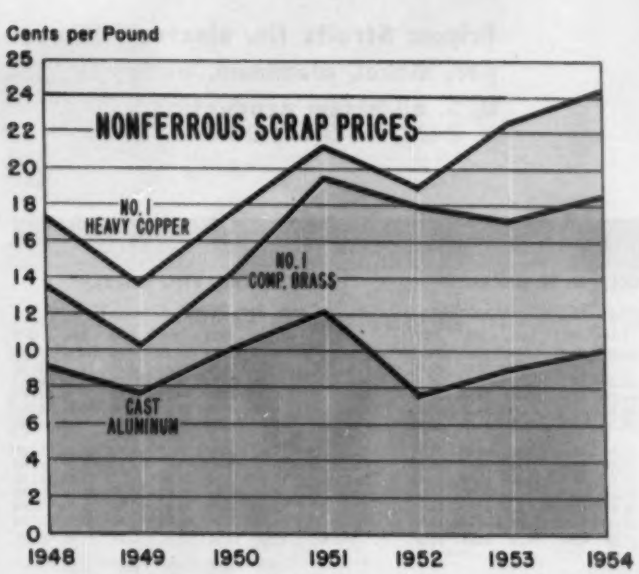
	1948	1949	1950	1951	1952	1953	1954
Jan.	$2.75	$3.20	$3.40	$3.60	$3.60	$3.775	$4.325
Feb.	2.75	3.20	3.40	3.60	3.60	3.775	4.325
Mar.	2.75	3.20	3.40	3.60	3.60	3.775	4.325
Apr.	2.75	3.20	3.40	3.60	3.60	3.775	4.325
May	2.70	3.20	3.40	3.60	3.60	3.981	4.325
June	2.70	3.20	3.40	3.60	3.60	4.181	4.325
July	2.80	3.20	3.40	3.60	3.685	4.325	4.442
Aug.	3.20	3.20	3.40	3.60	3.775	4.325	4.446
Sept.	3.20	3.20	3.40	3.60	3.775	4.325	4.446
Oct.	3.20	3.20	3.40	3.60	3.775	4.325	4.446
Nov.	3.20	3.20	3.40	3.60	3.775	4.325	4.446
Dec.	3.20	3.38	3.60	3.60	3.775	4.325	4.446
Average	2.93	3.21	3.42	3.60	3.676	4.102	4.387

* Prices quoted dollars per gross ton prior to Feb. 15, 1946. Net ton, Feb. 15 to Dec. 12, 1946.
† 1939-1944—$40.00 per gross ton.

STAINLESS STEEL SHEETS

No. 304, Cents Per Pound

	1948	1949	1950	1951	1952	1953	1954
Jan.	39.00	41.25	39.50	43.00	43.25	45.29	48.75
Feb.	39.00	41.25	39.50	43.00	43.25	45.29	48.75
Mar.	39.00	41.25	39.50	43.00	43.25	45.59	48.75
Apr.	39.00	40.81	39.50	43.00	43.25	46.50	48.75
May	39.00	39.50	39.50	43.00	43.25	46.50	45.63
June	39.00	39.50	39.00	43.00	43.25	47.45	43.75
July	39.00	39.00	40.52	43.25	43.67	48.75	43.75
Aug.	40.00	39.50	41.00	43.25	45.29	48.75	43.75
Sept.	40.37	39.50	41.00	43.25	45.29	48.75	43.75
Oct.	40.81	39.50	41.00	43.25	45.29	48.75	43.75
Nov.	41.25	39.50	41.00	43.25	45.29	48.75	43.75
Dec.	41.25	39.50	43.00	43.25	45.29	48.75	44.26
Average	39.79	40.05	40.36	43.125	44.13	47.43	45.62



Nonferrous Metals Powders

ALUMINUM SCRAP, CAST

Cents Per Pound, f.o.b. New York*

	1949	1950	1951	1952	1953	1954
Jan.	12.00	7.38	16.55	7.75	7.75	8.88
Feb.	10.25	7.25	16.50	7.75	8.63	8.50
March	8.15	7.25	15.63	7.75	9.50	8.85
April	8.72	7.38	16.88	7.75	9.13	10.25
May	6.25	7.88	17.25	7.75	8.25	11.00
June	5.65	8.05	17.25	7.25	9.20	10.00
July	5.38	8.75	8.15	7.25	10.00	10.00
Aug.	6.25	9.88	7.75	7.25	9.25	10.00
Sept.	7.30	12.00	7.75	7.25	9.00	10.75
Oct.	7.50	13.88	7.75	7.75	8.25	11.00
Nov.	8.00	15.15	7.75	7.75	9.63	11.00
Dec.	7.75	15.75	7.75	7.75	10.30	11.00
Average	7.60	10.10	12.08	7.51	9.07	10.10

* Dealers' Buying Price

BRASS SCRAP, No. 1 COMPOSITION

Cents Per Pound, f.o.b. New York*

	1949	1950	1951	1952	1953	1954
Jan.	14.19	11.13	17.25	18.25	17.75	18.44
Feb.	13.06	11.13	16.75	18.25	18.63	18.75
March	11.83	11.13	20.50	18.25	19.10	17.00
April	9.19	11.50	22.19	18.25	18.56	17.75
May	8.56	12.44	22.50	18.25	16.81	18.88
June	8.13	13.95	21.31	17.75	16.75	19.25
July	8.89	14.13	19.15	17.75	16.75	19.25
Aug.	8.88	15.50	18.50	17.75	15.44	19.25
Sept.	9.23	17.25	18.25	17.75	15.50	19.44
Oct.	9.13	17.75	18.25	17.74	16.06	20.03
Nov.	11.06	18.88	18.25	17.75	16.81	20.70
Dec.	10.73	18.50	18.25	17.75	17.38	21.00
Average	10.22	14.26	19.43	17.98	17.13	18.73

* Dealers Buying Price.

No. 1 HEAVY COPPER SCRAP

Cents Per Pound, f.o.b. New York*

	1949	1950	1951	1952	1953	1954
Jan.	18.75	13.97	19.75	19.00	19.00	22.63
Feb.	18.13	14.06	21.06	19.00	21.25	22.63
March	16.06	13.88	23.88	19.00	20.70	23.50
April	14.13	14.19	25.88	19.00	23.75	24.00
May	11.97	15.13	26.00	19.00	21.81	24.63
June	10.60	16.98	23.88	19.00	23.15	24.75
July	11.88	16.94	18.90	19.00	23.00	24.75
Aug.	12.31	18.66	19.00	19.00	21.25	24.75
Sept.	12.93	20.38	19.00	19.00	21.50	24.94
Oct.	12.25	22.25	19.00	19.00	22.13	25.63
Nov.	12.44	24.75	19.00	19.00	23.38	25.75
Dec.	13.28	19.75	19.00	19.00	23.56	26.63
Average	13.78	17.88	21.20	19.08	22.46	24.56

* Dealers Buying Price.

BRASS INGOTS, 85-5-5-5

No. 115, Cents Per Pound, Cars*

	1949	1950	1951	1952	1953	1954
Jan.	20.38	17.50	29.00	27.25	27.25	24.50
Feb.	19.01	17.50	29.00	27.25	27.81	23.75
March	17.96	17.50	29.00	27.25	29.50	23.50
April	16.94	17.81	29.00	27.25	28.00	25.75
May	15.07	18.41	29.00	27.25	26.00	26.50
June	13.96	21.33	29.00	27.25	26.00	27.00
July	13.76	22.11	29.00	27.25	25.63	27.00
Aug.	14.13	23.00	29.00	27.25	24.50	27.45
Sept.	14.91	25.50	27.69	27.25	24.50	28.13
Oct.	15.13	26.63	27.25	27.25	24.50	29.19
Nov.	16.81	26.60	27.25	27.25	24.50	29.50
Dec.	16.85	29.00	27.25	27.25	24.50	30.00
Average	16.24	21.14	28.45	27.25	26.06	28.06

* Delivered.

INGOT BRASS AND BRONZE

Short Tons of Shipments, Monthly

	1950	1951	1952	1953	1954
Jan.	18,874	28,416	28,315	24,423	20,861
Feb.	16,467	27,188	24,211	25,429	19,920
Mar.	22,494	31,997	23,890	25,256	23,653
Apr.	22,118	30,472	22,547	25,044	24,746
May	23,643	33,267	21,740	21,690	22,299
June	28,093	33,817	21,274	20,818	22,348
July	21,888	32,016	18,947	19,321	17,074
Aug.	29,689	25,295	21,607	20,156	21,694
Sept.	28,811	22,288	22,779	21,462	22,464
Oct.	32,240	23,124	28,811	22,820	24,080
Nov.	31,748	23,544	23,441	21,880	23,081
Dec.	28,767	20,967	22,963	20,841	22,000*
Total	303,863	332,378	277,736	271,251	254,160*

* Estimate

Source: Ingot Brass & Bronze Institute.

BRONZE INGOTS, 88-10-2

No. 245, Cents Per Pound, Cars*

	1949	1950	1951	1952	1953	1954
Jan.	24.13	19.63	36.00	33.70	34.50	29.50
Feb.	23.26	19.63	36.00	34.50	34.88	28.75
Mar.	21.81	19.63	36.75	34.50	36.00	28.50
April	20.26	20.00	37.00	34.50	33.56	31.94
May	17.82	20.72	37.00	34.50	30.25	32.75
June	16.71	23.70	37.00	34.50	30.25	33.25
July	16.51	24.38	37.00	34.50	30.06	33.25
Aug.	16.78	27.56	37.00	34.50	29.50	33.40
Sept.	17.41	29.88	34.38	34.50	29.50	33.69
Oct.	17.63	32.50	33.50	34.50	29.50	34.50
Nov.	16.81	36.20	33.50	34.50	29.50	34.75
Dec.	16.38	37.00	33.50	34.50	29.50	34.75
Average	19.11	28.50	35.72	34.43	31.42	32.42

* Delivered.

CADMIUM PRICES, STICKS, BARS

Dollars Per Pound, 1 to 5-Ton Lots

June 3, 1943 to July 17, 1946	$0.90
July 18, 1946 to November 20, 1946	1.25
November 21, 1946 to December 4, 1946	1.37½
December 5, 1946 to February 19, 1947	1.50
February 20, 1947 to August 11, 1948	1.75
August 12, 1948 to November 17, 1948	1.90
November 18, 1948 to June 14, 1950	2.00
June 15, 1950 to September 10, 1950	2.15
September 11, 1950 to November 30, 1950	2.40
December 2, 1950 to May 26, 1952	2.55
May 27, 1952 to August 5, 1952	2.25
August 6, 1952 to November 30, 1952	2.00
December 1, 1952 to December 13, 1952	1.90-2.00
December 13, 1952 to January 24, 1953	1.75-2.00
January 25, 1953 to January 31, 1954	2.00
February 1, 1954 to December 31, 1954	1.70

COBALT, 97 TO 99 PCT.

Per Pound, 550 lb Lots Since 1940

1940 to June 30, 1947[1]	$1.50
July 1, 1947 to March 31, 1949	1.65
April 1, 1949 to December 31, 1950	1.80
January 2, 1951 to October 1, 1951	2.10
October 1, 1951 to October 31 1953	2.40
November 2, 1953 to December 31, 1954	2.60

[1] 100 lb lots.

REMELT ALUMINUM INGOT

No. 12, Cents Per Pound, Cars*

	1949	1950	1951	1952	1953	1954
Jan.	23.50	16.50	30.50	19.50	19.50	19.38
Feb.	23.53	16.50	30.25	19.50	20.25	18.06
March	20.25	16.30	30.50	19.50	22.47	19.18
April	17.39	16.06	30.75	19.50	22.75	20.75
May	16.50	16.75	30.75	19.50	22.28	20.38
June	15.94	17.73	30.75	19.50	22.70	19.50
July	14.83	18.13	19.50	18.99	22.88	19.50
Aug.	15.38	21.65	19.50	19.28	22.13	19.78
Sept.	15.75	26.25	19.50	19.50	21.83	20.19
Oct.	15.75	27.06	19.50	19.50	20.28	20.81
Nov.	16.13	20.175	19.50	19.50	20.34	20.88
Dec.	16.50	31.00	19.50	19.50	20.28	21.13
Average	17.71	21.19	25.58	19.42	21.44	20.00

* Delivered.

Nonferrous

Prices: Straits tin, electrolytic copper, nickel, aluminum, antimony . . . U. S. aluminum production . . .

STRAITS TIN, PROMPT PRICE

Cents Per Pound, at New York

	1939	1940	1941†	1946	1947	1948
Jan.	46.38	46.73	50.16	52.00	70.00	94.00
Feb.	45.64	45.50	51.41	52.00	70.00	94.00
Mar.	46.17	47.07	52.07	52.00	70.00	94.00
Apr.	47.16	46.96	52.03	52.00	80.00	94.00
May	49.00	51.51	52.18	52.00	80.00	94.00
June	48.81	54.64	52.00	52.00	80.00	91.03
July	48.53	51.61	53.41	52.00	80.00	91.03
Aug.	46.80	51.21	52.46	52.00	80.00	91.03
Sept.	Nom.	50.32	52.00	52.00	80.00	91.03
Oct.	50.00	51.50	52.00	52.00	80.00	91.03
Nov.	52.65	50.57	52.00	61.50	80.00	91.03
Dec.	51.40	50.11	52.00	70.00	85.38	91.03
Average	49.11	49.84	52.03	54.00	77.86	99.25

	1949	1950	1951	1952	1953	1954
Jan.	$1.03	75.75	$1.72	$1.007	$1.215	84.83
Feb.	$1.03	74.00	$1.63	$1.215	$1.215	85.04
Mar.	$1.03	75.62	$1.46	$1.215	$1.214	91.86
Apr.	$1.03	76.38	$1.46	$1.215	$1.011	96.13
May	$1.03	77.50	$1.40	$1.215	97.50	93.51
June	$1.03	77.70	$1.18	$1.215	92.92	94.19
July	$1.03	89.00	$1.06	$1.215	81.90	96.54
Aug.	$1.03	$1.02	$1.03	$1.212	80.71	93.39
Sept.	$1.02	$1.01	$1.03	$1.213	82.36	93.52
Oct.	98.40	$1.13	$1.03	$1.212	80.86	93.05
Nov.	90.11	$1.30	$1.03	$1.213	83.11	91.14
Dec.	79.00	$1.40	$1.03	$1.215	84.61	88.86*
Average	99.22	96.53	$1.27	$1.204	90.70	91.84*

* Tentative. † 1942-1945, incl.: 52.00.

ANTIMONY, U. S. METAL

Cents Per Pound, F.O.B. Laredo, Tex.

	1948	1950	1951	1952	1953	1954
Jan.	38.50	30.05	34.50	50.00	34.50	28.50
Feb.	38.50	27.75	42.00	50.00	34.50	28.50
March	38.50	24.50	42.00	50.00	34.50	28.50
April	38.50	24.50	42.00	50.00	34.50	28.50
May	38.50	24.50	42.00	42.75	34.50	28.50
June	38.50	24.50	42.00	39.00	34.50	28.50
July	38.50	24.50	42.00	39.00	34.50	28.50
Aug.	38.50	24.50	42.00	39.00	34.50	28.50
Sept.	38.50	31.13	42.00	39.00	34.50	28.50
Oct.	33.62	32.00	42.00	39.00	34.50	28.50
Nov.	32.00	32.00	46.25	35.63	33.72	28.50
Dec.	32.00	32.00	50.00	34.50	28.50	28.50
Average	37.01	27.06	42.21	42.32	33.94	28.50

Nonferrous market reports and price quotations are a weekly Iron Age feature. "Review and Forecast," p. 163 also reports on nonferrous metals.

ELECTROLYTIC COPPER

Cents Per Pound, Conn. Valley

	1938	1939	1940*	1945*	1947	1948
Jan.	10.42	11.25	12.22	12.00	19.58	21.50
Feb.	10.00	11.25	11.40	12.00	19.75	21.50
Mar.	10.00	11.25	11.38	12.00	21.50	21.50
Apr.	10.00	10.47	11.33	12.00	21.50	21.50
May	9.80	10.06	11.32	12.00	22.63	21.50
June	9.00	10.00	11.37	14.28	21.63	21.50
July	9.81	10.22	10.81	14.375	21.50	21.50
Aug.	10.12	10.49	10.96	14.375	21.50	23.43
Sept.	10.25	11.93	11.84	14.375	21.50	23.50
Oct.	10.98	12.44	12.00	14.375	21.50	23.50
Nov.	11.25	12.50	12.00	17.19	21.50	23.50
Dec.	11.25	12.50	12.00	19.50	21.50	23.50
Average	10.22	11.20	11.53	14.04	21.30	22.33

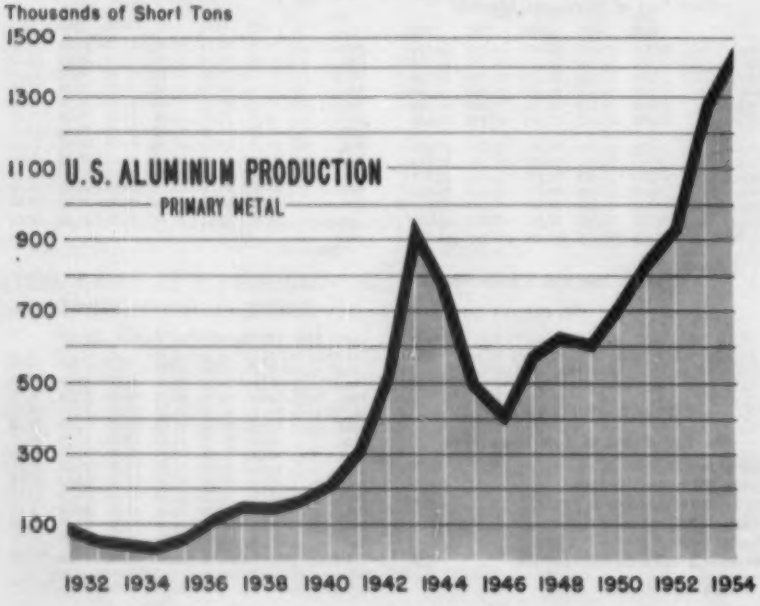
	1949	1950	1951	1952	1953	1954
Jan.	23.50	18.50	24.50	24.50	24.50	29.75
Feb.	23.50	18.50	24.50	24.50	25.41	29.75
Mar.	23.49	18.50	24.50	24.50	30.56	29.97
Apr.	21.72	18.94	24.50	24.50	30.70	29.97
May	18.05	19.92	24.50	24.50	29.85	30.00
June	16.66	22.27	24.50	24.50	29.88	30.00
July	17.23	22.50	24.50	24.50	29.88	30.00
Aug.	17.63	22.54	24.50	24.50	29.39	30.00
Sept.	17.63	23.25	24.50	24.50	29.50	30.00
Oct.	17.63	24.50	24.50	24.50	29.61	30.00
Nov.	18.42	24.50	24.50	24.50	29.75	30.00
Dec.	18.50	24.50	24.50	24.50	29.75	30.00
Average	19.51	21.54	24.50	24.50	29.07	29.95

* 1941-1945 incl.: 12.00.

U. S. PRODUCTION OF PRIMARY ALUMINUM

	1946	1947	1948	1949	1950	1951	1952	1953	1954
Jan.	24,750	50,048	48,767	53,336	52,023	67,954	76,934	99,898	116,247
Feb.	22,250	47,002	45,699	49,749	50,443	62,748	72,374	92,549	110,483
Mar.	26,000	53,032	51,874	54,882	58,747	70,022	77,069	104,920	122,239
Apr.	25,900	51,007	53,277	54,078	58,024	67,701	76,880	102,071	120,431
May	24,650	51,110	55,450	56,909	61,929	67,720	80,804	105,477	125,144
June	27,600	48,288	48,567	54,184	60,460	67,454	77,478	104,152	120,756
July	25,750	47,998	52,937	56,777	62,518	72,998	78,368	109,288	126,162
Aug.	26,650	47,054	54,953	52,005	63,006	73,816	85,175	110,545	125,296
Sept.	41,100	43,228	53,285	49,742	59,449	68,429	78,882	109,333	120,332
Oct.	45,000	43,989	54,526	46,790	62,916	72,647	77,312	108,219	125,089
Nov.	46,300	43,461	50,714	35,885	62,276	72,248	74,839	105,637	121,252
Dec.	50,700	47,589	53,474	41,161	65,897	72,454	63,409	110,291	125,000*
Total	409,630	571,790	623,483	603,462	718,622	838,861	937,321	1,262,015	1,458,508*

* Estimate. Source: U. S. Bureau of Mines and Aluminum Association.



ELECTROLYTIC NICKEL

Cents Per Pound, New York, Duty Paid

1929 to Nov. 24, 1946	35.00
Nov. 25, 1946 to Dec. 31, 1947	37.67
Jan. 1, 1948 to July 21, 1948	38.86
July 22, 1948 to Feb. 15, 1949	42.90
Feb. 16, 1949 to Oct. 4, 1949	42.93
Oct. 5, 1949 to May 31, 1950	42.97
June 1, 1950 to Dec. 12, 1950	51.22
Dec. 13, 1950 to June 1, 1951	53.55
June 2, 1951 to Jan. 13, 1953	59.58
Jan. 14, 1953 to Nov. 23, 1954	63.08
Nov. 24, 1954 to Dec. 31, 1954	67.67

ALUMINUM 99 PCT INGOT

Cents Per Pound, Freight Allowed

	1937	1938	1939	1940	1941*	1948*
Jan.	20.50	20.00	20.00	20.00	17.00	15.00
Feb.	20.50	20.00	20.00	20.00	17.00	15.00
March	20.00	20.00	20.00	20.00	17.00	15.00
April	20.00	20.00	20.00	19.00	17.00	15.00
May	20.00	20.00	20.00	19.00	17.00	15.00
June	20.00	20.00	20.00	19.00	17.00	15.00
July	20.00	20.00	20.00	19.00	17.00	16.00
Aug.	20.00	20.00	20.00	18.00	17.00	16.00
Sept.	20.00	20.00	20.00	18.00	17.00	16.00
Oct.	20.00	20.00	20.00	18.00	15.00	16.70
Nov.	20.00	20.00	20.00	17.50	15.00	17.00
Dec.	20.00	20.00	20.00	17.00	15.00	17.00
Average	20.00	20.00	20.00	18.71	16.80	16.66

	1949	1950	1951	1952	1953	1954
Jan.	17.00	17.00	19.00	19.00	20.23	21.50
Feb.	17.00	17.00	19.00	19.00	20.50	21.50
March	17.00	17.00	19.00	19.00	20.50	21.50
April	17.00	17.00	19.00	19.00	20.50	21.50
May	17.00	17.20	19.00	19.00	20.50	21.50
June	17.00	17.50	19.00	19.00	20.50	21.50
July	17.00	17.50	19.00	19.00	20.94	21.50
Aug.	17.00	17.50	19.00	20.00	21.50	22.08
Sept.	17.00	17.00	19.00	20.00	21.50	22.20
Oct.	17.00	19.00	19.00	20.00	21.50	22.20
Nov.	17.00	19.00	19.00	20.00	21.50	22.20
Dec.	17.00	19.00	19.00	20.00	21.50	22.20
Average	17.00	17.70	19.00	19.42	20.93	21.75

* 1942-1947 incl.: 15.00.

Nonferrous

Prices: Lead, magnesium, zinc . . .
U. S. primary magnesium production.
Metal powder prices, including iron.

LEAD PRICE, COMMON GRADE

Cents Per Pound, at New York

	1938	1939	1940	1941†	1946†	1947	1948
Jan.	4.87	4.83	5.47	5.50	6.50	13.00	15.00
Feb.	4.63	4.86	5.06	5.00	6.50	13.25	15.00
Mar.	4.50	4.82	5.19	5.77	6.50	15.00	15.00
Apr.	4.50	4.78	5.07	5.85	6.50	15.00	17.21
May	4.40	4.75	5.02	5.85	6.50	15.00	17.50
June	4.15	4.80	5.00	5.85	8.19	15.00	17.50
July	4.86	4.85	5.00	5.85	9.18	15.00	17.00
Aug.	4.90	5.04	4.85	5.85	8.25	15.00	19.50
Sept.	5.00	5.45	4.93	5.85	8.25	15.00	19.50
Oct.	5.10	5.50	5.31	5.66	8.26	15.00	19.50
Nov.	5.09	5.50	5.73	5.85	10.41	15.00	21.50
Dec.	4.94	5.50	5.90	5.85	12.20	15.00	21.50
Average	4.74	5.05	5.18	5.79	8.10	14.69	18.04

	1949	1950	1951	1952	1953	1954
Jan.	21.50	12.00	17.00	18.00	14.19	13.26
Feb.	21.50	12.00	17.00	19.00	13.50	12.82
Mar.	18.96	10.96	17.00	19.00	13.40	12.94
Apr.	15.15	10.63	17.00	18.91	12.64	13.61
May	13.72	11.72	17.00	16.73	12.74	14.00
June	12.00	11.51	17.00	15.08	13.41	14.11
July	13.56	11.66	17.00	16.00	13.88	14.00
Aug.	14.99	12.93	17.00	16.00	14.00	14.00
Sept.	15.05	15.00	17.00	16.00	13.74	14.00
Oct.	13.42	16.00	16.93	14.40	13.50	14.98
Nov.	12.52	17.00	19.00	14.16	13.50	15.00
Dec.	12.00	17.00	19.00	14.13	13.50	*15.00
Average	15.37	13.29	17.49	16.45	13.48	*14.08

† 1942-1945 incl.: 6.50. *Tentative

MAGNESIUM, 99.8 PCT INGOT

Cents Per Pound, at Freeport, Tex.

1929	55.00	1938	30.00	1947	20.00
1930	48.00	1939	27.00	1948	20.00
1931	34.00	1940	27.00	1949	20.00
1932	29.00	1941	27.00	1950	22.02
1933	28.00	1942	22.00	1951	24.00
1934	26.00	1943	20.00	1952	24.00
1935	30.00	1944	20.00	1953	26.94
1936	30.00	1945	20.00	1954	27.75
1937	30.00	1946	20.00		

PRIME WESTERN ZINC PRICE

Cents Per Pound, at New York

	1938	1939	1940	1941†	1946†	1947	1948
Jan.	5.35	4.89	6.03	7.85	8.85	11.005	11.00
Feb.	5.17	4.89	5.93	7.85	8.85	11.005	12.61
Mar.	4.77	4.89	6.14	7.85	8.66	11.005	12.61
Apr.	4.53	4.89	6.14	7.85	8.85	11.005	12.61
May	4.43	4.89	6.20	7.85	8.85	11.005	12.64
June	4.53	4.89	6.63	7.85	8.85	11.005	12.66
July	5.14	4.91	6.54	7.85	8.89	11.005	13.09
Aug.	5.14	5.11	6.79	7.85	8.89	11.005	15.85
Sept.	5.24	5.51	7.33	7.85	8.89	11.005	15.85
Oct.	5.40	5.89	7.66	8.38	9.28	11.03	15.74
Nov.	5.12	5.89	7.64	8.85	10.86	11.06	17.27
Dec.	4.89	5.46	7.66	8.85	10.94	11.06	18.15
Average	4.98	5.51	6.73	7.9	9.09	11.02	14.20

	1949	1950	1951	1952	1953	1954
Jan.	18.16	9.48	18.22	20.29	12.43	10.26
Feb.	18.20	10.47	18.22	20.29	12.31	9.88
Mar.	17.76	10.66	18.22	20.29	11.86	10.16
Apr.	14.76	11.41	18.25	20.29	11.83	10.75
May	12.98	12.71	18.25	20.33	11.83	10.79
June	10.27	15.49	18.25	16.67	11.83	11.46
July	10.06	15.72	18.25	15.83	11.67	11.50
Aug.	10.70	15.72	18.26	14.66	11.53	11.50
Sept.	10.77	17.82	18.29	14.66	10.58	11.98
Oct.	10.04	18.22	20.22	14.66	10.50	12.00
Nov.	10.46	18.22	20.29	13.33	10.50	12.00
Dec.	10.47	18.22	20.29	13.33	10.50	*12.00
Average	12.85	14.51	18.75	17.03	11.54	*11.19

† 1942-1945, incl.: 8.85. *Tentative

IRON POWDER, AVERAGE MONTHLY PRICES

Cents Per Pound, F.O.B. Mill Unless Otherwise Specified

	Swedish Sponge, c.i.f. N. Y., Ocean Bags, −100 Mesh	Domestic Sponge, 98+Pct Fe, Carload Lots, −100 Mesh	Electrolytic, Annealed, 99.5+Pct Fe, −100 Mesh	Electrolytic, Unannealed, −325 Mesh 99+Pct Fe	Hydrogen Reduced, −300 Mesh 98+Pct Fe	Carbonyl, 5-10 Microns, 98−99.8+ Pct Fe
1949 Aver.	7.8 to 9.0	9.0 to 15.0	31.0 to 39.5	48.5	83.0 to 85.0	90.0 to 175.0
1950 Aver.	7.4 to 9.0	9.0 to 15.0	38.0 to 39.5	48.5	83.0 to 85.0	70.0 to 135.0
1951 Aver.	7.4 to 9.0	12.65 to 16.16	40.45	51.48	83.0 to 85.0	90.64 to 146.0
1952 Aver.	8.57 to 9.79	15.5 to 17.0	43.1	56.2	83.0 to 85.0	83.0 to 148.0
1953 Aver.	11.5	16.96	44.0	60.00	83.0 to 85.0	83.0 to 148.0
1954 Aver.	11.25	16.35	40.75	56.48	83.0 to 85.0	83.0 to 148.0

AVERAGE ZINC POWDER PRICE

Cents per lb, F.O.B. Mill—100 Mesh

1948 Average	15.41 to 18.71
1949 Average	15.41 to 18.71
1950 Average	20.50 to 23.85
1951 Average	22.54 to 29.25
1952 Average	23.0 to 30.5
1953 Average	17.36 to 24.86
1954 Average	17.50 to 25.00

AVERAGE COPPER POWDER PRICE

Cents per lb, F.O.B. Mill—100 Mesh

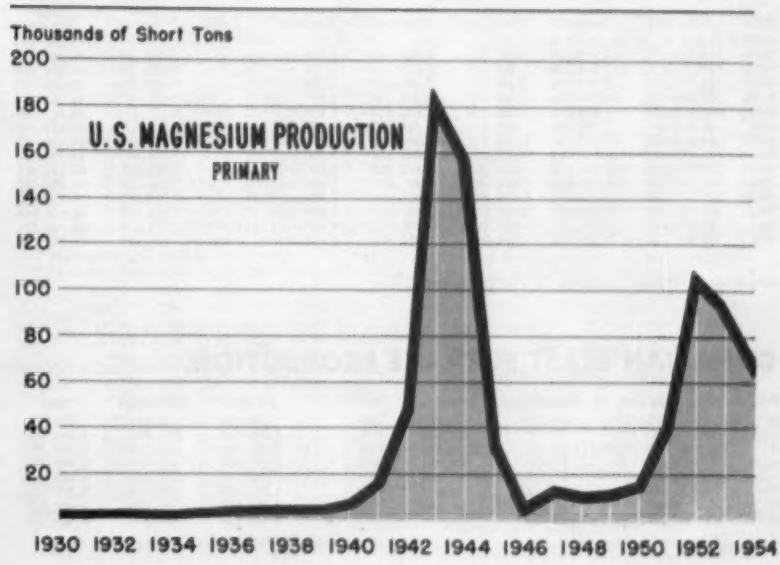
	Electrolytic	Reduced
1949 Average	29.62	30.06
1950 Average	31.23	31.43
1951 Average	35.17	34.50
1952 Average	35.25	34.00
1953 Average	41.49	41.14
1954 Average	43.50	43.50

U.S. PRODUCTION OF PRIMARY MAGNESIUM

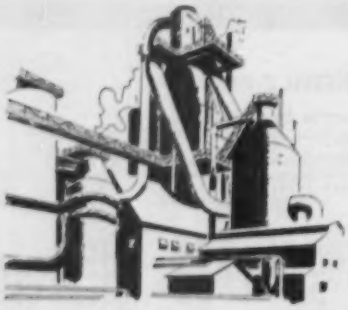
Short Tons, Excludes Crystal Equivalent of Mg Content of Fire Bombs in 1943, 1944

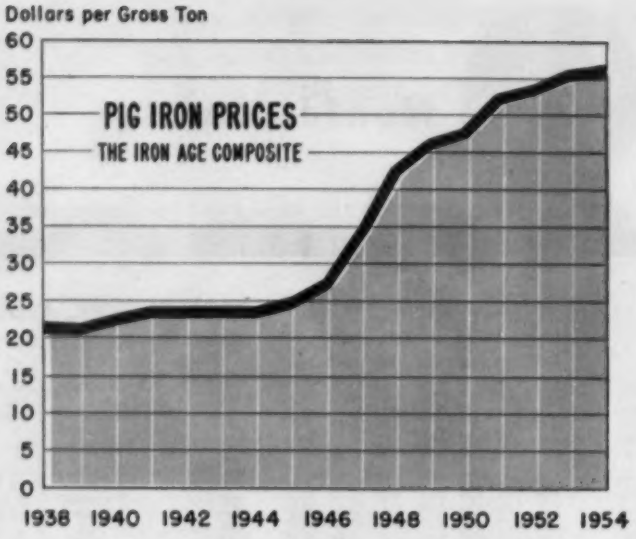
Month	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954
January	10,300	20,056	3,816	95	1,388	883	988	1,002	1,878	7,425	9,906	6,446
February	10,688	19,537	2,956	48	1,232	830	884	913	1,709	7,764	9,078	5,656
March	13,008	19,571	3,297	10	1,472	887	986	948	1,885	8,893	10,352	6,545
April	13,556	17,986	3,174	....	1,153	901	956	957	2,043	8,800	9,751	6,293
May	15,093	16,217	3,171	....	926	797	987	972	2,194	9,083	9,116	6,460
June	15,077	13,750	3,404	241	948	786	950	1,175	2,612	8,670	7,286	6,190
July	16,584	14,134	4,586	892	905	792	985	1,132	2,988	9,529	6,267	6,049
August	17,160	11,861	4,500	889	849	809	970	1,400	3,418	9,771	6,263	5,771
September	16,199	8,296	2,963	886	886	819	974	1,535	4,166	8,422	6,076	5,325
October	16,011	7,370	1,017	1,000	912	873	941	1,880	5,147	8,990	6,341	5,149
November	10,374	5,301	715	558	870	814	909	1,760	6,043	9,123	6,227	5,900*
December	19,554	3,321	101	795	893	932	1,004	1,942	6,923	9,323	6,467	6,200*
Total	183,604	167,100	32,792	5,317	12,344	10,003	11,598	16,726	40,914	105,833	93,075	72,000*

Producers' reports to WPB, Jan. 1942 to Aug. 1945, thereafter to Bureau of Mines and Magnesium Assn.
* Iron Age Estimate.



Pig Iron and Iron Ore





COMPOSITE PIG IRON PRICE

Average of THE IRON AGE quotations on basic pig iron at Valley furnaces and foundry iron at Chicago, Birmingham, Buffalo, Valley and Philadelphia, in gross tons.

	1933	1934	1936	1937	1938	1939
Jan.	$13.56	$16.90	$18.84	$20.25	$23.25	$20.61
Feb.	13.56	16.90	18.84	20.50	23.25	20.61
March	13.56	16.90	18.84	22.65	23.25	20.61
April	13.76	17.07	18.84	23.25	23.25	20.61
May	14.48	17.90	18.84	23.25	23.25	20.61
June	15.01	17.90	18.84	23.25	22.90	20.61
July	15.50	17.90	18.84	23.25	19.61	20.61
August	16.09	17.90	18.73	23.25	19.61	20.61
Sept.	16.71	17.90	18.73	23.25	19.82	21.61
October	16.61	17.90	18.73	23.25	20.57	22.61
Nov.	16.61	17.90	18.90	23.25	20.61	22.61
Dec.	16.90	17.90	18.73	23.25	20.61	22.61
Average	15.20	17.58	18.90	22.74	21.67	21.19

	1940	1941*	1942*	1946	1947	1948
Jan.	$22.61	$23.45	$23.61	$25.37	$30.14	$39.83
Feb.	22.61	23.45	24.11	25.37	30.15	40.27
March	22.61	23.53	24.61	25.75	32.92	40.32
April	22.61	23.61	24.61	26.12	33.15	40.11
May	22.61	23.61	24.61	26.45	33.15	40.33
June	22.61	23.61	24.61	29.13	33.15	40.81
July	22.61	23.61	24.61	29.13	34.52	42.25
August	22.61	23.61	24.61	30.13	36.84	44.34
Sept.	22.61	23.61	24.61	28.13	36.90	44.96
October	22.61	23.61	24.91	28.13	36.90	46.63
Nov.	22.61	23.61	25.37	28.13	37.94	48.84
Dec.	22.95	23.61	25.37	29.64	37.24	48.91
Average	22.64	23.56	24.81	27.29	34.35	42.94

	1949	1950	1951	1952	1953	1954
Jan.	$48.79	$48.99	$52.89	$52.72	$56.26	$56.59
Feb.	48.74	48.38	52.89	52.72	56.26	56.59
March	48.74	48.38	52.89	52.72	56.26	56.59
April	48.64	48.38	52.89	52.72	56.26	56.59
May	45.97	48.38	52.89	52.77	56.26	56.59
June	45.91	48.38	52.89	52.77	55.32	56.59
July	45.91	48.38	52.89	53.27	56.73	56.59
August	45.91	48.86	52.89	55.26	56.76	56.59
Sept.	45.90	47.16	52.89	55.26	56.66	56.59
October	45.88	48.29	52.72	55.26	56.59	56.59
Nov.	45.88	49.69	52.72	55.26	56.59	56.59
Dec.	45.88	52.50	52.72	55.26	56.59	56.59
Average	46.16	47.86	52.70	53.53	56.06	56.59

* Price unchanged at $23.61 from 1942 through 1944.

PRODUCTION OF PIG IRON AND FERROALLOYS, Net Tons

	PIG IRON								FERROALLOYS*			
Years	Basic	Bessemer	Low Phosphorus	Foundry	Malleable	Forge	All Other, Including Direct Castings	Total Pig Iron	Ferromang. and Spiegeleisen	Ferrosilicon and Silvery Pig Iron	All Other Ferroalloys	Total Ferroalloys
1954	.....	.....	.....	.....	.....	.....	.....	61,000,000	.....	.....	.....	1,901,000
1953	59,982,912	6,110,681	297,088	2,500,996	3,784,456	.....	325,517	74,901,429	1,007,248	772,338	569,152	2,348,739
1952	47,611,189	7,448,715	307,478	2,670,210	3,120,168	.....	256,178	61,312,938	820,800	749,059	471,150	2,041,017
1951	54,212,809	9,045,964	314,725	3,000,628	3,383,349	.....	287,995	70,274,278	965,805	919,085	389,375	2,174,265
1950	49,880,440	6,090,606	335,416	2,806,247	3,181,043	.....	293,151	64,586,907	776,881	630,667	196,656	1,813,404
1949	40,905,386	7,099,418	301,620	2,603,912	2,409,426	.....	232,922	53,412,862	675,029	667,322	161,872	1,504,223
1948	46,315,064	7,731,530	364,425	2,789,310	2,880,606	.....	284,031	60,055,216	805,013	842,385	208,945	1,856,343
1947	44,604,743	7,182,207	331,116	2,663,405	2,874,752	.....	182,667	58,328,912	800,725	862,976	184,706	1,780,407
1946	33,727,656	6,932,414	167,013	2,545,936	2,190,285	.....	215,493	44,778,796	540,061	724,141	156,828	1,421,030
1945	39,896,962	6,255,513	314,063	2,248,857	2,380,076	.....	167,648	53,223,169	706,078	817,849	171,933	1,695,860
1944	45,595,008	9,756,536	474,686	2,190,681	2,494,609	.....	294,559	61,007,439	809,638	837,944	211,177	1,858,759
1943	46,374,662	10,256,788	536,632	2,059,501	2,393,241	.....	185,648	60,810,670	803,623	923,486	232,294	1,969,277
1942	43,532,865	9,865,220	862,672	2,646,530	2,399,520	.....	169,137	59,075,944	785,103	880,643	161,414	1,827,360
1941	39,759,841	9,622,343	474,428	2,760,827	2,417,137	1,074	164,901	55,100,551	730,000	729,716	126,328	1,586,053
1940	33,967,734	7,381,320	448,996	2,292,175	1,832,491	3,990	120,490	46,071,066	748,996	498,032	81,135	1,328,863

Including ferroalloys produced in electric furnaces.

Source: American Iron and Steel Institute.

CANADIAN BLAST FURNACE PRODUCTION, Net Tons Including Ferroalloys

Year	Pig Iron	Ferroalloys	Total	Year	Pig Iron	Ferroalloys	Total	Year	Pig Iron	Ferroalloys	Total
1931	470,442	52,375	522,817	1939	848,418	85,531	931,949	1947	1,969,847	149,832	2,119,679
1932	161,425	18,100	179,525	1940	1,399,101	161,661	1,460,822	1948	2,120,909	250,669	2,371,588
1933	254,592	33,737	288,329	1941	1,629,054	213,218	1,741,272	1949	2,154,382	211,603	2,365,985
1934	455,789	37,055	492,844	1942	1,975,015	213,636	2,188,651	1950	2,309,732	181,575	2,491,307
1935	676,302	61,102	740,404	1943	1,758,285	218,667	1,982,626	1951	2,552,666	250,530	2,803,626
1936	799,618	67,679	867,297	1944	1,852,629	162,429	4,012,906	1952	2,662,665	232,038	2,914,101
1937	1,606,717	91,931	1,698,648	1945	1,777,968	196,978	1,964,936	1953	3,012,280	150,503	3,162,864
1938	729,710	89,720	949,430	1946	1,409,758	116,995	1,529,753	1954*	2,118,428	99,896	2,218,324

* Estimated

Source: Dominion Bureau of Statistics

Pig iron

Prices: Foundry iron at Buffalo, Chicago, Granite City, Valley and Birmingham . . . Valley malleable.

CHICAGO FOUNDRY PIG IRON

Per Gross Ton, at Furnace

	1938	1939*	1945*	1946	1947	1948
Jan.	$24.00	$23.00	$24.00	$25.75	$30.50	$38.75
Feb.	24.00	23.00	24.50	25.75	30.50	39.00
Mar.	24.00	23.00	25.00	26.13	33.00	38.00
Apr.	24.00	23.00	25.00	26.50	33.00	39.00
May	24.00	23.00	25.00	26.50	33.00	39.00
June	23.20	23.00	25.00	26.50	33.00	38.00
July	20.00	23.00	25.00	26.50	34.20	42.00
Aug.	20.00	23.00	25.00	26.50	36.00	39.00
Sept.	20.25	23.00	25.00	26.50	36.00	43.00
Oct.	21.00	23.00	25.30	26.50	36.00	46.50
Nov.	21.00	23.00	25.75	26.50	36.00	46.50
Dec.	21.00	23.40	25.75	30.10	36.40	46.50
Average	22.20	23.03	25.02	27.64	34.00	41.77

	1949	1950	1951	1952	1953	1954
Jan.	$46.50	$46.50	$52.50	$52.50	$55.00	$56.50
Feb.	46.50	46.50	52.50	52.50	55.00	56.50
Mar.	46.50	46.50	52.50	52.50	55.00	56.50
Apr.	46.50	46.50	52.50	52.50	55.00	56.50
May	46.50	46.50	52.50	52.50	55.00	56.50
June	46.50	46.50	52.50	52.50	55.00	56.50
July	46.50	46.50	52.50	53.00	56.50	56.50
Aug.	46.50	46.50	52.50	55.00	56.50	56.50
Sept.	46.50	47.00	52.50	55.00	56.50	56.50
Oct.	46.50	49.50	52.50	55.00	56.50	56.50
Nov.	46.50	49.50	52.50	55.00	56.50	56.50
Dec.	46.50	52.50	52.50	55.00	56.50	56.50
Average	46.50	47.58	52.50	53.75	55.75	56.50

* Price unchanged at $24.00 from 1941 through 1944.

GRANITE CITY, ILL., PIG IRON

Foundry, Gross Ton, at Furnace

	1938	1940*	1945*	1946	1947	1948
Jan.	$21.00	$23.00	$24.00	$25.75	$30.50	$39.25
Feb.	21.00	23.00	24.50	25.75	30.50	40.00
Mar.	21.00	23.00	25.00	26.13	32.00	40.00
Apr.	21.00	23.00	25.00	26.50	33.50	40.00
May	21.00	23.00	25.00	26.50	33.50	41.43
June	21.00	23.00	25.00	26.50	33.50	45.75
July	21.00	23.00	25.00	26.50	34.60	45.75
Aug.	21.00	23.00	25.00	26.50	36.63	47.34
Sept.	22.00	23.00	25.00	26.50	37.00	48.40
Oct.	23.00	23.00	25.30	26.50	37.00	48.40
Nov.	23.00	23.00	25.75	26.50	37.00	48.40
Dec.	23.00	23.50	25.75	29.70	37.00	48.40
Average	21.58	23.04	25.02	27.44	34.39	44.42

	1949	1950	1951	1952	1953	1954
Jan.	$48.40	$48.40	$54.40	$54.40	$56.90	$58.40
Feb.	48.40	48.40	54.40	54.40	56.90	58.40
Mar.	48.40	48.40	54.40	54.40	56.90	58.40
Apr.	48.40	48.40	54.40	54.40	56.90	58.40
May	48.40	48.40	54.40	54.40	56.90	58.40
June	48.40	48.40	54.40	54.40	56.90	58.40
July	48.40	48.40	54.40	54.90	58.40	58.40
Aug.	48.40	48.40	54.40	56.90	58.40	58.40
Sept.	48.40	48.40	54.40	56.90	58.40	58.40
Oct.	48.40	51.40	54.40	56.90	58.40	58.40
Nov.	48.40	51.40	54.40	56.90	58.40	58.40
Dec.	48.40	53.65	54.40	56.90	58.40	58.40
Average	48.40	49.34	54.40	55.48	57.65	58.40

* Price unchanged at $24.00 from 1941 through 1944.

MALLEABLE PIG IRON PRICES

Per Gross Ton, Mahoning, Shenango Valley

	1938	1939	1940*	1945*	1946	1947
Jan.	$24.00	$21.00	$23.00	$24.00	$25.75	$30.50
Feb.	24.00	21.00	23.00	24.50	25.75	30.50
Mar.	24.00	21.00	23.00	25.00	26.13	33.00
Apr.	24.00	21.00	23.00	25.00	26.50	33.50
May	24.00	21.00	23.00	25.00	26.50	33.50
June	23.00	21.00	23.00	25.00	26.50	33.50
July	20.00	21.00	23.00	25.00	26.50	34.70
Aug.	20.00	21.00	23.00	25.00	26.50	36.50
Sept.	20.25	22.00	23.00	25.00	26.50	36.50
Oct.	21.00	23.00	23.00	26.30	26.50	36.50
Nov.	21.00	23.00	23.00	25.75	26.50	36.50
Dec.	21.00	23.00	23.40	25.75	30.10	36.70
Average	22.20	21.88	23.03	25.02	27.64	34.36

BUFFALO FOUNDRY PIG IRON

Per Gross Ton, at Furnace

	1939	1940*	1945*	1946	1947	1948
Jan.	$21.00	$23.00	$24.00	$25.75	$30.50	$40.37
Feb.	21.00	23.00	24.50	25.75	30.50	42.12
Mar.	21.00	23.00	25.00	26.13	32.38	42.45
Apr.	21.00	23.00	25.00	26.50	33.00	41.19
May	21.00	23.00	25.00	26.50	33.00	41.37
June	21.00	23.00	25.00	26.50	33.00	41.44
July	21.00	23.00	25.00	26.50	34.20	42.00
Aug.	21.00	23.00	25.00	26.50	37.37	44.90
Sept.	22.00	23.00	25.00	26.50	37.10	46.87
Oct.	23.00	23.00	25.30	26.50	37.00	47.12
Nov.	23.00	23.00	25.75	26.50	37.75	47.80
Dec.	23.00	23.40	25.75	30.10	38.00	47.50
Average	21.59	23.03	25.02	27.64	34.49	43.65

	1949	1950	1951	1952	1953	1954
Jan.	$47.25	$46.50	$52.50	$52.50	$55.00	$56.50
Feb.	47.00	46.50	52.50	52.50	55.00	56.50
Mar.	47.00	46.50	52.50	52.50	55.00	56.50
Apr.	46.75	46.50	52.50	52.50	55.00	56.50
May	46.50	46.50	52.50	52.50	55.00	56.50
June	46.50	46.50	52.50	52.50	55.00	56.50
July	46.50	46.50	52.50	53.00	56.50	56.50
Aug.	46.50	46.50	52.50	55.00	56.50	56.50
Sept.	46.50	47.25	52.50	55.00	56.50	56.50
Oct.	46.50	49.50	52.50	55.00	56.50	56.50
Nov.	46.50	49.50	52.50	55.00	56.50	56.50
Dec.	46.50	52.50	52.50	55.00	56.50	56.50
Average	46.67	47.56	52.50	53.75	55.75	56.50

* Price unchanged at $24.00 from 1941 through 1944.

BIRMINGHAM PIG IRON PRICES

Foundry Grade, Per Gross Ton

	1939*	1941**	1945**	1946	1947	1948
Jan.	$17.38	$19.38	$20.38	$22.13	$22.13	$37.38
Feb.	17.38	19.38	20.88	22.13	26.88	37.38
Mar.	17.38	19.88	21.38	22.51	29.13	37.38
Apr.	17.38	20.38	21.38	22.88	29.88	37.38
May	17.38	20.38	21.38	22.88	29.88	38.38
June	17.38	20.38	21.38	24.88	29.88	39.38
July	17.38	20.38	21.38	24.88	31.38	31.04
Aug.	17.38	20.38	21.38	24.88	34.13	43.38
Sept.	18.38	20.38	21.38	24.88	34.88	43.38
Oct.	19.38	20.38	21.66	24.88	34.88	43.38
Nov.	19.38	20.38	22.13	24.88	34.88	43.38
Dec.	19.38	20.38	22.13	26.88	34.60	43.38
Average	17.96	20.17	21.40	24.06	31.43	40.43

	1949	1950	1951	1952	1953	1954
Jan.	$43.38	$39.38	$46.88	$46.88	$51.38	$52.88
Feb.	43.38	42.38	46.88	46.88	51.38	52.88
Mar.	43.38	42.38	46.88	46.88	51.38	52.88
Apr.	43.38	42.38	46.88	46.88	51.38	52.88
May	39.71	42.38	46.88	46.88	51.38	52.88
June	39.38	42.38	46.88	46.88	51.38	52.88
July	39.38	42.38	46.88	49.38	52.88	52.88
Aug.	39.38	42.38	46.88	51.38	52.88	52.88
Sept.	39.38	42.67	46.88	51.38	52.88	52.88
Oct.	39.38	45.88	46.88	51.38	52.88	52.88
Nov.	39.38	45.88	46.88	51.38	52.88	52.88
Dec.	39.38	46.88	46.88	51.38	52.88	52.88
Average	40.74	43.53	46.88	49.96	52.13	52.88

* Price unchanged at $19.38 through 1940.
** Price unchanged at $20.38 from 1942 through 1944.

	1948**	1950	1951	1952	1953	1954
Jan.	$39.50	$46.50	$52.50	$52.50	$55.00	$56.50
Feb.	39.50	46.50	52.50	52.50	55.00	56.50
Mar.	39.50	46.50	52.50	52.50	55.00	56.50
Apr.	39.50	46.50	52.50	52.50	55.00	56.50
May	39.50	46.50	52.50	52.50	55.00	56.50
June	39.50	46.50	52.50	52.50	55.00	56.50
July	42.50	46.50	52.50	53.00	56.50	56.50
Aug.	43.50	46.00	52.50	55.00	56.50	56.50
Sept.	43.50	47.50	52.50	55.00	56.50	56.50
Oct.	46.12	49.50	52.50	55.00	56.50	56.50
Nov.	46.50	49.50	52.50	55.00	56.50	56.50
Dec.	46.50	52.50	52.50	55.00	56.50	56.50
Average	42.13	47.58	52.50	53.75	55.75	56.50

* Price unchanged at $24.00 from 1941 through 1944.
** Price unchanged at $46.50 through 1949.

FOUNDRY PIG IRON PRICES

Mahoning, Shenango Valley, Per Gross Ton

	1938	1939	1940*	1945*	1946	1947
Jan.	$24.00	$21.00	$23.00	$24.00	$25.75	$30.50
Feb.	24.00	21.00	23.00	24.50	25.75	30.50
Mar.	24.00	21.00	23.00	25.00	26.13	33.00
Apr.	24.00	21.00	23.00	25.00	26.50	33.50
May	24.00	21.00	23.00	25.00	26.50	33.50
June	23.20	21.00	23.00	25.00	26.50	33.50
July	20.00	21.00	23.00	25.00	26.50	34.70
Aug.	20.00	21.00	23.00	25.00	26.50	36.50
Sept.	20.25	22.00	23.00	25.00	26.50	36.50
Oct.	21.00	23.00	23.00	26.30	26.50	36.50
Nov.	21.00	23.00	23.00	25.75	26.50	36.50
Dec.	21.00	23.00	23.40	25.75	30.10	36.70
Average	22.20	21.88	23.03	25.02	27.64	34.36

	1948**	1950	1951	1952	1953	1954
Jan.	$39.37	$46.50	$52.50	$52.50	$55.00	$56.50
Feb.	39.50	46.50	52.50	52.50	55.00	56.50
Mar.	39.50	46.50	52.50	52.50	55.00	56.50
Apr.	39.50	46.50	52.50	52.50	55.00	56.50
May	39.50	46.50	52.50	52.50	55.00	56.50
June	39.50	46.50	52.50	52.50	55.00	56.50
July	42.50	46.50	52.50	53.00	56.50	56.50
Aug.	43.50	46.50	52.50	55.00	56.50	56.50
Sept.	43.50	47.50	52.50	55.00	56.50	56.50
Oct.	46.12	49.50	52.50	55.00	56.50	56.50
Nov.	46.50	49.50	52.50	55.00	56.50	56.50
Dec.	46.50	52.12	52.50	55.00	56.50	56.50
Average	42.12	47.55	52.50	53.75	55.75	56.50

* Price unchanged at $24.00 from 1941 through 1944.
** Price unchanged at $46.50 through 1949.

BASIC PIG IRON, VALLEY

Mahoning, Shenango Valley, Gross Ton

	1938	1939	1940*	1945*	1946	1947
Jan.	$23.50	$20.50	$22.50	$23.50	$25.25	$30.00
Feb.	23.50	20.50	22.50	24.00	25.25	30.00
Mar.	23.50	20.50	22.50	24.50	25.63	33.00
Apr.	23.50	20.50	22.50	24.50	26.00	33.00
May	23.50	20.50	22.50	24.50	26.00	33.00
June	22.70	20.50	22.50	24.50	26.00	33.00
July	19.50	20.50	22.50	24.50	26.00	34.20
Aug.	19.50	20.50	22.50	24.50	26.00	36.00
Sept.	19.75	21.50	22.50	24.50	26.00	36.00
Oct.	20.50	22.50	22.50	24.50	26.00	36.00
Nov.	20.50	22.50	22.50	25.25	26.00	36.00
Dec.	20.50	22.50	22.50	25.25	29.66	36.20
Average	21.70	21.00	22.53	24.52	27.14	34.79

	1948**	1950	1951	1952	1953	1954
Jan.	$38.87	$46.00	$52.00	$52.00	$54.50	$56.00
Feb.	39.00	46.00	52.00	52.00	54.50	56.00
Mar.	39.00	46.00	52.00	52.00	54.50	56.00
Apr.	39.00	46.00	52.00	52.00	54.50	56.00
May	39.00	46.00	52.00	52.00	54.50	56.00
June	39.00	46.00	52.00	52.00	54.50	56.00
July	42.00	46.00	52.00	52.50	56.00	56.00
Aug.	43.00	46.00	52.00	54.50	56.00	56.00
Sept.	43.00	46.75	52.00	54.50	56.00	56.00
Oct.	45.62	49.00	52.00	54.50	56.00	56.00
Nov.	46.00	49.00	52.00	54.50	56.00	56.00
Dec.	46.00	51.62	52.00	54.50	56.00	56.00
Average	41.62	47.03	52.00	53.08	55.25	56.00

* Price unchanged at $23.50 from 1941 through 1944.
** Price unchanged at $46.00 through 1949.

The business outlook for '55 plus top metalworking developments and trends are summed up in a special section starting on p. 163. Automotive review and forecast starts on p. 212. For the machine tool outlook for 1955 turn to p. 223.

Iron ore

Prices: Lake Superior ore, beehive coke. Iron ore analyses, shipments and prices for various grades . . .

LAKE SUPERIOR IRON ORES

Avgs. Analyses, Combined Ranges, Grades

Year	Analysis, Pct Iron, Natural	Phos.	Silica	Mang.	Moisture
1953	50.39	0.90	10.25	0.75	10.90
1952	50.49	0.111	10.05	0.77	10.78
1951	50.25	0.090	9.87	0.77	11.22
1950	50.38	0.092	9.85	0.77	11.11
1949	50.39	0.096	9.72	0.76	11.12
1948	50.49	0.093	9.30	0.76	11.38
1947	50.91	0.093	9.09	0.75	11.25
1946	51.32	0.087	8.83	0.74	11.22
1945	51.69	0.089	8.62	0.72	10.96
1944	51.72	0.086	8.42	0.74	11.02
1943	51.66	0.091	8.32	0.62	11.06
1942	51.65	0.089	8.21	0.79	10.98
1941	51.83	0.085	8.18	0.78	11.01
1940	52.09	0.085	8.00	0.77	10.83
1939	51.75	0.085	8.27	0.76	10.73
1938	51.90	0.089	8.25	0.81	10.13

Source: Lake Superior Iron Ore Assn.

SHIPMENTS OF IRON ORE

Lake Superior Shipments, Gross Tons

1937	61,873,000
1938	15,353,000
1939	44,984,000
1940	63,308,000
1941	79,941,000
1942	92,070,000
1943	86,116,000
1944	81,039,000
1945	75,207,000
1946	86,975,000
1947	77,210,278
1948	82,665,757
1949	69,566,298
1950	79,206,582
1951	89,092,012
1952	74,910,758
1953	95,844,449
1954	60,793,697

Source: Lake Superior Iron Ore Assn.

U. S. IRON ORE CONSUMPTION

In Long Tons

1944	99,942,454
1945	85,158,485
1946	72,174,844
1947	96,115,849
1948	100,496,867
1949	91,123,220
1950	105,010,273
1951	114,837,112
1952	110,645,636
1953	122,124,661
1954*	100,570,000

* Estimate by The Iron Age.

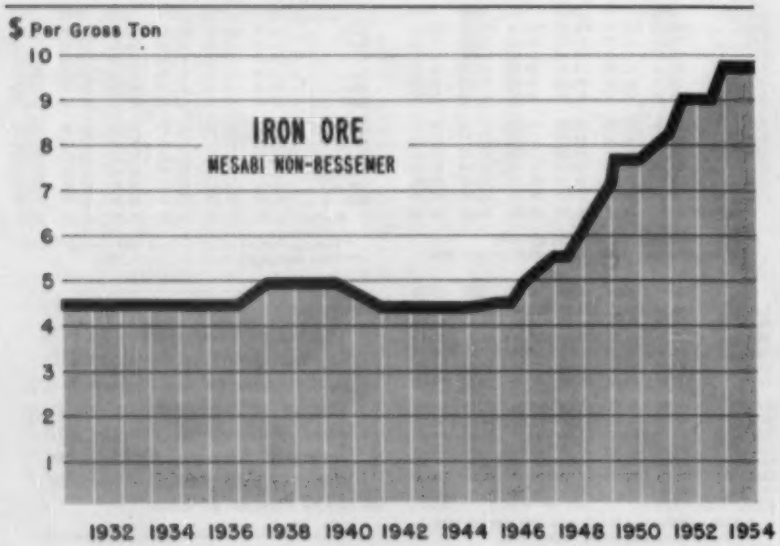
Source: U. S. Bureau of Mines.

LAKE SUPERIOR IRON ORE PRICES

Per Gross Ton at Lower Lake Ports

BESSEMER ORES	Guarantee		Price	
	Iron Natural	Phosphorus Dry	Old Range	Mesabi
1925 through 1928	$1.50	0.045	4.55	4.45
1929 through 1936	$1.50	0.045	4.80	4.65
1937 to Apr. 15, 1940	$1.50	0.045	5.25	5.10
1940-Apr. 16 on	$1.50	0.045	4.75	4.60
1941 through 1944	$1.50	0.045	4.75	4.60
1945 to June 24, 1946	$1.50	0.045	4.95	4.70
1946-June 24 to Dec. 31	$1.50	0.045	5.45	5.20
1947 to Apr. 1, 1948	$1.50	0.045	5.95	5.70
1948-Apr. 1 on	$1.50	0.045	6.60	6.35
1949	$1.50	0.045	7.60	7.35
1950-Feb. 1 to Dec. 1	$1.50	0.045	8.10	7.85
1950-Dec. 1 on	$1.50	0.045	8.70	8.45
1951	$1.50	0.045	8.70	8.45
1952 to July 25	$1.50	0.045	8.70	8.45
1952-July 25 on	$1.50	0.045	9.45	9.20
1953 to June 30	$1.50	0.045	10.10	9.85
1953-July 1 on	$1.50	0.045	10.30	10.05
1954	$1.50	0.045	10.30	10.05

NON-BESSEMER	Guarantee	Price		
	Iron Natural	Old Range	Mesabi	High Phosphorus
1925 through 1928	$1.50	4.40	4.25	4.15
1929 through 1936	$1.50	4.85	4.80	4.40
1937 to Apr. 15, 1940	$1.50	5.10	4.95	4.85
1940-Apr. 16 on	$1.50	4.80	4.45	4.35
1941 through 1944	$1.50	4.80	4.45	4.35
1945 to June 24, 1946	$1.50	4.80	4.55	4.55
1946-June 24 to Dec. 31	$1.50	5.30	5.05	5.05
1947 to Apr. 1, 1948	$1.50	5.80	5.55	5.55
1948-Apr. 1 on	$1.50	6.45	6.20	6.20
1949	$1.50	7.45	7.20	7.20
1950-Feb. 1 to Dec. 1	$1.50	7.95	7.70	7.70
1950-Dec. 1 on	$1.50	8.55	8.30	8.30
1951	$1.50	8.55	8.30	8.30
1952 to July 25	$1.50	8.55	8.30	8.30
1952-July 25 on	$1.50	9.30	9.05	9.05
1953 to June 30	$1.50	9.95	9.70	9.70
1953-July 1 on	$1.50	10.15	9.90	9.90
1954	$1.50	10.15	9.90	9.90



CONNELLSVILLE FOUNDRY COKE

Net Ton at Oven, Monthly Review

	1943*	1944	1945	1946	1947	1948
Jan.	$8.00	$8.00	$8.25	$9.00	$8.50	$14.00
Feb.	7.13	8.25	8.25	9.00	9.35	14.00
Mar.	7.38	8.25	8.25	9.00	10.25	14.00
Apr.	7.38	8.25	8.25	9.00	10.65	14.00
May	7.44	8.25	8.47	9.00	11.25	14.00
June	7.50	8.25	9.00	9.50	11.25	16.00
July	7.50	8.25	9.00	9.50	12.75	16.50
Aug.	7.50	8.25	9.00	9.50	13.75	17.00
Sept.	7.50	8.25	9.00	9.50	13.75	17.00
Oct.	7.50	8.25	9.00	9.50	13.94	17.00
Nov.	7.50	8.25	9.00	9.50	14.00	17.00
Dec.	7.50	8.25	9.00	9.50	14.00	17.00
Average	7.39	8.24	8.71	9.85	11.96	15.62

	1949	1950	1951	1952	1953	1954
Jan.	$16.94	$16.75	$17.25	$17.75	$17.75	$16.75
Feb.	16.75	16.75	17.25	17.75	17.75	16.75
Mar.	16.50	16.25	17.50	17.75	17.63	16.75
Apr.	16.50	16.25	17.75	17.75	17.25	16.75
May	16.38	16.25	17.75	17.75	17.25	16.75
June	16.25	16.25	17.75	17.75	17.25	16.75
July	16.13	16.25	17.75	17.75	17.25	16.75
Aug.	15.75	16.25	17.75	17.75	17.25	16.75
Sept.	15.75	16.25	17.75	17.75	16.95	16.75
Oct.	15.75	16.75	17.75	17.75	16.75	16.75
Nov.	15.75	16.75	17.75	17.75	16.75	16.75
Dec.	15.75	17.12	17.75	17.75	16.75	16.75
Average	16.18	16.32	17.65	17.75	17.22	16.75

* Price unchanged at $8.00 throughout 1942.

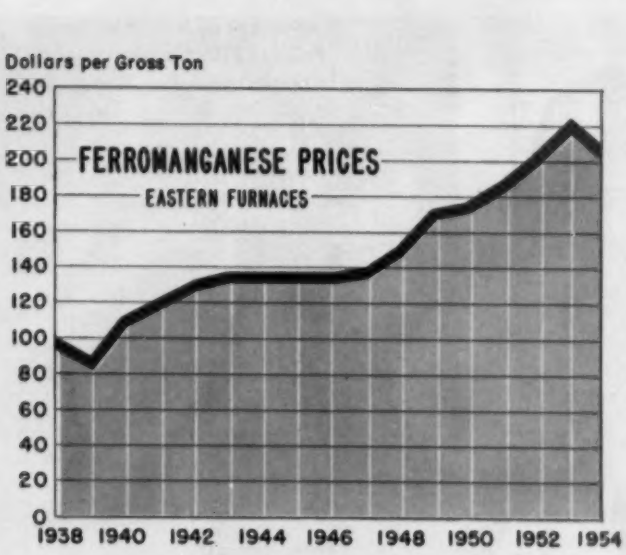
CONNELLSVILLE FURNACE COKE

Net Ton at Oven, Monthly Review

	1942	1943*	1944*	1946	1947	1948
Jan.	$6.13	$6.00	$7.00	$7.50	$8.75	$12.50
Feb.	6.00	6.25	7.00	7.50	8.00	12.50
Mar.	6.00	6.50	7.00	7.50	9.00	12.50
Apr.	6.00	6.50	7.00	7.50	9.00	12.50
May	6.00	6.00	7.15	7.50	10.50	12.50
June	6.00	6.50	7.50	7.50	10.50	12.70
July	6.00	6.50	7.50	8.50	11.40	13.88
Aug.	6.00	6.00	7.50	8.75	12.00	14.75
Sept.	6.00	6.50	7.50	8.75	12.00	15.00
Oct.	6.00	6.50	7.50	8.75	12.38	15.00
Nov.	6.00	6.50	7.50	8.75	12.50	15.00
Dec.	6.00	6.00	7.50	8.75	12.50	15.00
Average	6.01	6.45	7.30	8.19	10.83	13.63

	1949	1950	1951	1952	1953	1954
Jan.	$16.56	$14.00	$14.25	$14.75	$14.75	$14.38
Feb.	15.25	14.00	14.25	14.75	14.75	14.38
Mar.	14.50	14.13	14.50	14.75	14.75	14.38
Apr.	14.50	14.25	14.75	14.75	14.75	14.38
May	14.38	14.25	14.75	14.75	14.75	14.38
June	14.25	14.25	14.75	14.75	14.75	14.38
July	14.25	14.25	14.75	14.75	14.75	14.38
Aug.	14.25	14.25	14.75	14.75	14.75	14.38
Sept.	14.25	14.25	14.75	14.75	14.53	14.38
Oct.	14.25	14.25	14.75	14.75	14.38	14.38
Nov.	14.20	14.25	14.75	14.75	14.38	14.38
Dec.	14.00	14.25	14.75	14.75	14.38	14.38
Average	14.58	14.20	14.66	14.75	14.64	14.38

* Price unchanged at $7.00 thoughout 1944.



Ferroalloys

Furnace

Bricks

FERROMANGANESE, 80 PCT

Eastern Producers, Carloads, Cents Per Lb

	1936	1937	1938	1939	1940*	1942**	1947**	1948†	1949	1950	1951	1952	1953‡	1954‡
Jan.	3.35	3.57	4.50	3.75	4.46	5.36	6.03	6.47	7.21	7.74	8.27	8.31	10.10	10.00
Feb.	3.35	3.57	4.50	3.57	4.46	5.36	6.03	6.47	7.21	7.74	8.31	8.31	10.10	10.00
March	3.35	3.97	4.50	3.57	4.46	5.36	6.03	6.47	7.96	7.74	8.31	8.31	10.10	10.00
April	3.35	4.24	4.50	3.57	4.46	5.36	6.03	6.47	7.74	7.74	8.31	8.31	10.00	10.00
May	3.35	4.49	4.50	3.57	4.46	6.03	6.03	6.47	7.74	7.74	8.31	8.31	10.12	10.00
June	3.35	4.50	4.50	3.57	4.91	6.03	6.03	6.47	7.74	7.74	8.31	8.31	10.00	10.00
July	3.35	4.50	4.13	3.57	5.36	6.03	6.03	6.47	7.74	7.74	8.31	8.31	10.00	10.00
Aug.	3.35	4.50	4.13	3.57	5.36	6.03	6.03	6.47	7.74	7.74	8.31	9.85	10.00	10.00
Sept.	3.35	4.50	4.13	4.24	5.36	6.03	6.03	6.47	7.74	7.74	8.31	10.10	10.00	9.50
Oct.	3.35	4.50	4.13	4.46	5.36	6.03	6.47	7.23	7.74	7.74	8.31	10.10	10.00	9.50
Nov.	3.57	4.50	4.13	4.46	5.36	6.03	6.47	7.23	7.74	7.97	8.31	10.10	10.00	9.50
Dec.	3.57	4.50	4.13	4.46	5.36	6.03	6.47	7.23	7.74	8.00	8.31	10.10	10.00	9.50
Average	3.39	4.40	4.35	3.87	4.95	5.80	6.14	6.66	7.84	7.79	8.31	9.02	10.04	9.83

† Seaboard price prior to Oct. 7, 1948. ‡ Starting June, 1953, prices reflect new standard of 74 to 76 pct Mn. Prices prior to that converted from older gross ton pricing method. * Price unchanged at 5.36¢ through 1941. ** Price unchanged at 6.03¢ from 1943 through 1946.

SPIEGELEISEN, 19 TO 21 PCT.

Palmerton, Pa., Carloads, Gross Ton

	1949	1950	1951	1952	1953	1954
Jan.	$62.00	$65.00	$75.00	$75.00	$85.00	$86.00
Feb.	62.00	65.00	75.00	75.00	85.00	86.00
Mar.	63.20	65.00	75.00	75.00	85.00	86.00
Apr.	65.00	65.00	75.00	75.00	85.00	86.00
May	65.00	65.00	75.00	75.00	85.00	86.00
June	65.00	65.00	75.00	75.00	86.00	86.00
July	65.00	65.00	75.00	75.00	86.00	86.00
Aug.	65.00	65.00	75.00	82.50	86.00	86.00
Sept.	65.00	67.50	75.00	85.00	86.00	86.00
Oct.	65.00	70.00	75.00	85.00	86.00	86.00
Nov.	65.00	70.00	75.00	85.00	86.00	86.00
Dec.	65.00	72.50	75.00	85.00	86.00	86.00
Average	64.35	66.66	75.00	78.96	85.58	86.00

50 PCT FERROSILICON

Cents per lb contained Si, Carloads, Delivered

	1949	1950	1951	1952	1953	1954
Jan.	11.30	11.30	12.40	12.40	12.40	12.40
Feb.	11.30	11.30	12.40	12.40	12.40	12.40
Mar.	11.30	11.30	12.40	12.40	12.40	12.40
Apr.	11.30	11.30	12.40	12.40	12.40	10.80
May	11.30	11.30	12.40	12.40	12.40	10.80
June	11.30	11.30	12.40	12.40	12.40	10.80
July	11.30	11.30	12.40	12.40	12.40	10.80
Aug.	11.30	11.30	12.40	12.40	12.40	10.80
Sept.	11.30	11.30	12.40	12.40	12.40	11.52
Oct.	11.30	11.30	12.40	12.40	12.40	12.00
Nov.	11.30	12.00	12.40	12.40	12.40	12.00
Dec.	11.30	12.20	12.40	12.40	12.40	12.00
Average	11.30	11.43	12.40	12.40	12.40	11.56

CHEM. BONDED MAGNESITE BRICK

F.o.b. Baltimore, Dollars per Net Ton

	1948	1949	1950	1951	1952	1953	1954
Jan.	$75.00	$80.00	$80.00	$83.00	$83.00	$87.50	$87.50
Feb.	75.00	80.00	80.00	93.00	93.00	97.50	97.50
Mar.	75.00	80.00	80.00	93.00	93.00	97.50	97.50
Apr.	75.00	80.00	80.00	93.00	93.00	97.50	97.50
May	75.00	80.00	80.00	93.00	93.00	97.50	97.50
June	75.00	80.00	80.00	93.00	93.00	97.50	97.50
July	76.00	80.00	80.00	93.00	93.00	97.50	97.50
Aug.	80.00	80.00	83.00	93.00	93.00	97.50	97.50
Sept.	80.00	80.00	83.00	93.00	93.00	97.50	97.50
Oct.	80.00	80.00	86.00	93.00	97.50	97.50	97.50
Nov.	80.00	80.00	88.00	93.00	97.50	97.50	97.50
Dec.	80.00	80.00	88.00	93.00	97.50	97.50	97.50
Average	77.00	80.00	82.06	93.00	94.13	97.50	97.50

BURNED MAGNESITE BRICK

F.o.b. Baltimore, Dollars per Net Ton

	1948	1949	1950	1951	1952	1953	1954
Jan.	$85.00	$91.00	$91.00	$104.00	$104.00	$109.00	$109.00
Feb.	86.00	91.00	91.00	104.00	104.00	109.00	109.00
Mar.	86.00	91.00	91.00	104.00	104.00	109.00	109.00
Apr.	86.00	91.00	91.00	104.00	104.00	109.00	109.00
May	86.00	91.00	91.00	104.00	104.00	109.00	109.00
June	86.00	91.00	91.00	104.00	104.00	109.00	109.00
July	87.00	91.00	91.00	104.00	104.00	109.00	109.00
Aug.	91.00	91.00	93.40	104.00	104.00	109.00	109.00
Sept.	91.00	91.00	94.00	104.00	104.00	109.00	109.00
Oct.	91.00	91.00	97.50	104.00	109.00	109.00	109.00
Nov.	91.00	91.00	99.00	104.00	109.00	109.00	109.00
Dec.	91.00	91.00	99.00	104.00	109.00	109.00	109.00
Average	88.00	91.00	93.28	104.00	105.25	109.00	109.00

FIRST QUALITY FIRE CLAY BRICK

Pa.,* Ky., Mo., Ill., Md., Ohio, F.o.b. Plant**

	1947	1948§	1950	1951	1952	1953	1954
Jan.	$65.00	$73.00	$86.00	$94.60	$94.60	$ 99.30	$109.00
Feb.	65.00	73.00	86.00	94.60	94.60	99.30	109.00
Mar.	65.00	73.00	86.00	94.60	94.60	99.30	109.00
Apr.	68.00	73.00	86.00	94.60	94.60	99.30	109.00
May	70.00	73.00	86.00	94.60	94.60	99.30	109.00
June	70.00	73.00	86.00	94.60	94.60	99.30	109.00
July	70.00	74.00	86.00	94.60	94.60	99.30	109.00
Aug.	70.00	80.00	86.00	94.60	94.60	99.30	109.00
Sept.	70.00	80.00	86.00	94.60	94.60	106.12	113.00
Oct.	70.00	80.00	91.16	94.60	99.30	109.00	114.00
Nov.	70.00	80.00	94.60	94.60	99.30	109.00	114.00
Dec.	72.00	80.00	94.60	94.60	99.30	109.00	114.00
Average	69.00	76.00	88.83	94.60	95.78	102.21	110.58

§ Price unchanged at $80.00 through 1949.
* Add $5.00 for Salina, Pa., after May, 1948.
** Carloads per 1000 brick.

CHEM. BONDED CHROME BRICK

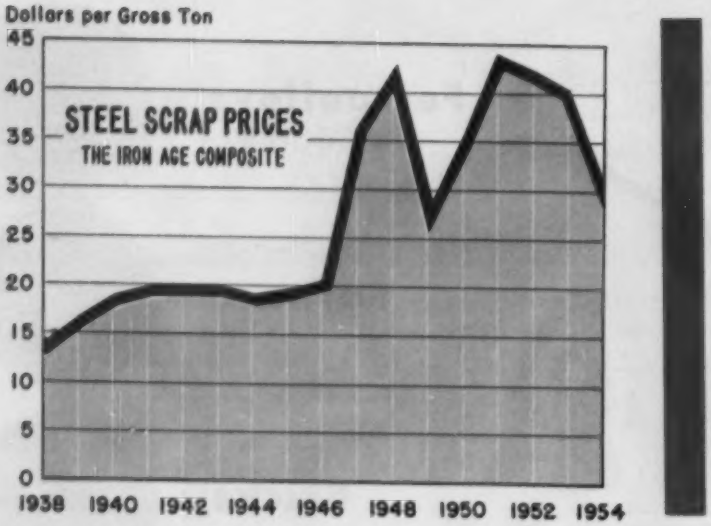
F.o.b. Baltimore, Dollars per Net Ton

	1948	1949	1950	1951	1952	1953	1954
Jan.	$64.00	$68.00	$69.00	$82.00	$82.00	$86.00	$86.00
Feb.	64.00	68.00	69.00	82.00	82.00	86.00	86.00
Mar.	64.00	68.00	69.00	82.00	82.00	86.00	86.00
Apr.	64.00	68.00	69.00	82.00	82.00	86.00	86.00
May	64.00	68.00	69.00	82.00	86.00	86.00	86.00
June	64.00	68.00	69.00	82.00	86.00	86.00	86.00
July	65.00	68.00	69.00	82.00	82.00	86.00	86.00
Aug.	69.00	68.00	71.40	82.00	82.00	86.00	86.00
Sept.	69.00	68.00	72.00	82.00	82.00	86.00	86.00
Oct.	69.00	68.00	76.00	82.00	86.00	86.00	86.00
Nov.	69.00	68.00	77.00	82.00	86.00	86.00	86.00
Dec.	69.00	68.00	77.00	82.00	86.00	86.00	86.00
Average	66.00	68.00	71.25	82.00	83.00	86.00	86.00

SILICA BRICK STANDARD GRADE

Mt. Union, Pa., Ensley, Ala., Carloads per 1000 Brick, F.o.b. plant

	1949	1950	1951	1952	1953	1954
Jan.	$80.00	$88.00	$94.60	$94.60	$99.30	$115.00
Feb.	80.00	88.00	94.60	94.60	99.30	115.00
Mar.	80.00	88.00	94.60	94.60	99.30	115.00
Apr.	80.00	88.00	94.60	94.60	99.30	115.00
May	80.00	88.00	94.60	94.60	99.30	115.00
June	80.00	88.00	94.60	94.60	99.30	115.00
July	80.00	88.00	94.60	94.60	99.30	115.00
Aug.	80.00	88.00	94.60	94.60	99.30	115.00
Sept.	80.00	88.00	94.60	94.60	108.72	119.00
Oct.	80.00	91.16	94.60	99.30	115.00	120.00
Nov.	80.00	94.60	94.60	99.30	115.00	120.00
Dec.	80.00	94.60	94.60	99.30	115.00	120.00
Average	80.00	88.83	94.60	96.78	104.01	116.58



Average of Iron Age Scrap Prices. Pittsburgh, Chicago, Philadelphia Per Gross Ton

	1941*	1944*	1945	1946	1947	1948
Jan.	$20.00	$19.17	$19.17	$19.17	$31.00	$40.81
Feb.	20.00	19.17	19.17	19.17	33.31	40.35
Mar.	20.25	19.17	19.17	19.17	30.65	40.00
Apr.	19.22	19.17	19.17	19.17	33.86	40.31
May	19.17	19.17	19.17	19.17	29.81	40.00
June	19.17	19.17	19.17	19.17	32.79	40.00
July	19.17	19.17	19.17	19.17	37.86	41.00
Aug.	19.17	19.16	19.17	19.17	39.46	43.16
Sept.	19.17	17.87	19.17	19.17	37.77	43.16
Oct.	19.17	15.87	19.17	19.17	40.50	43.16
Nov.	19.17	16.54	19.17	23.34	41.21	43.04
Dec.	19.17	19.04	19.17	26.23	40.00	43.00
Average	19.48	18.85	19.16	20.27	36.36	41.65

	1949	1950	1951	1952	1953	1954
Jan.	$41.36	$26.54	$46.15	$42.00	$42.00	$28.67
Feb.	33.21	27.25	44.19	42.00	42.92	25.92
Mar.	35.43	28.05	43.00	42.00	44.18	23.63
Apr.	23.86	29.04	43.00	42.00	41.75	25.36
May	22.67	33.40	43.00	42.00	38.59	27.79
June	20.75	39.29	43.00	41.37	40.97	27.88
July	19.33	37.25	43.00	40.10	44.60	28.87
Aug.	20.85	39.85	43.00	42.00	43.46	29.33
Sept.	25.67	40.00	43.00	42.00	38.53	29.71
Oct.	26.40	40.67	42.50	42.00	32.67	32.83
Nov.	29.90	40.98	42.00	42.00	35.21	33.46
Dec.	27.18	44.02	42.00	42.00	31.33	32.46
Average	27.56	34.75	43.15	41.79	39.52	29.89

* Price unchanged at $19.17 throughout 1942 and 1943.

CHICAGO HEAVY MELTING SCRAP

Prices of No. 1 Scrap, Per Gross Ton‡

	1941*	1944*	1945	1946	1947	1948
Jan.	$20.00	$18.75	$18.75	$18.75	$20.75	$39.56
Feb.	19.25	18.75	18.75	18.75	31.63	39.12
Mar.	19.88	18.75	18.75	18.75	36.69	38.88
Apr.	18.95	18.75	18.75	18.75	33.05	39.16
May	18.75	18.75	18.75	18.75	29.38	39.25
June	18.75	18.75	18.75	18.75	30.06	39.25
July	18.75	18.75	18.75	18.75	36.97	40.81
Aug.	18.75	18.75	18.75	18.75	39.08	41.75
Sept.	18.75	18.00	18.75	18.76	38.75	41.75
Oct.	18.75	16.00	18.75	18.75	40.50	41.75
Nov.	18.75	17.00	18.75	23.13	39.13	41.75
Dec.	18.75	18.00	18.75	27.25	38.90	41.75
Average	19.01	18.27	18.76	19.87	36.46	40.40

	1949	1950	1951	1952	1953	1954
Jan.	$40.06	$26.70	$44.63	$41.50†	$41.50†	$28.13
Feb.	35.63	27.50	43.02	41.50†	42.50	25.80
Mar.	33.70	26.25	42.50†	41.50†	43.50	24.50
Apr.	23.63	26.75	42.50†	41.50†	39.06	26.13
May	23.00	33.75	42.50†	41.50†	36.25	30.30
June	20.88	38.75	42.50†	40.75	39.30	31.40
July	18.75	37.25	42.50†	38.30	43.38	33.00
Aug.	22.00	39.15	42.50†	41.50†	42.25	29.50
Sept.	26.30	39.61	42.50†	41.50†	34.40	30.00
Oct.	25.50	39.75	42.50†	41.50†	31.00	33.75
Nov.	30.30	39.75	41.50†	41.50†	33.88	33.30
Dec.	26.75	43.44	41.50†	41.50†	31.00	33.00
Average	27.29	35.32	42.76	41.25	38.24	29.71

* Price unchanged at $18.75 throughout 1942 and 1943.
‡ Changed from net ton basis April 30, 1941.
† OPS basing point price ceiling.

PHILADELPHIA HEAVY MELTING

Prices of No. 1 Scrap, Per Gross Ton

	1941*	1944*	1945	1946	1947	1948
Jan.	$20.50	$18.75	$18.75	$18.75	$31.00	$42.50
Feb.	20.00	18.75	18.75	18.75	33.38	41.50
Mar.	20.00	18.75	18.75	18.75	39.38	40.80
Apr.	19.00	18.75	18.75	18.75	33.10	41.50
May	18.75	18.75	18.40	18.75	29.69	42.31
June	18.75	18.75	18.25	18.75	33.63	42.50
July	18.75	18.75	18.75	18.75	39.45	43.12
Aug.	18.75	18.60	18.75	18.75	33.50	45.00
Sept.	18.75	18.66	18.75	18.75	36.90	45.00
Oct.	18.75	14.60	18.75	18.75	40.25	45.00
Nov.	18.75	15.60	18.75	22.94	42.83	44.75
Dec.	18.75	18.50	18.75	26.00	41.10	44.50
Average	19.13	17.91	18.66	19.87	36.50	43.20

	1949	1950	1951	1952	1953	1954
Jan.	$42.75	$23.10	$46.70	$41.50†	$41.50†	$27.63
Feb.	39.75	23.00	43.75	41.50†	42.50	25.00
Mar.	36.10	23.85	42.50†	41.50†	44.30	22.10
Apr.	23.00	25.30	42.50†	41.50†	42.75	21.50
May	22.00	28.70	42.50†	41.50†	40.50	22.75
June	19.50	34.63	42.50†	40.50	41.50	22.75
July	17.50	32.81	42.50†	40.65	43.69	23.25
Aug.	18.31	38.50	42.50†	41.50†	43.38	26.00
Sept.	23.38	38.50	42.50†	41.50†	35.90	26.13
Oct.	24.25	38.50	42.10†	41.50†	31.50	30.75
Nov.	24.50	39.44	41.50†	41.50†	34.50	32.70
Dec.	24.25	42.81	41.50†	41.50†	29.90	31.38
Average	26.19	32.27	42.75	41.35	39.33	26.16

* Price unchanged at $18.75 throughout 1942 and 1943.
† OPS basing point price ceiling.

PITTSBURGH HEAVY MELTING

Prices of No. 1 Scrap, Per Gross Ton

	1941*	1944*	1945	1946	1947	1948
Jan.	$22.13	$20.00	$20.00	$20.00	$32.25	$40.37
Feb.	21.00	20.00	20.00	20.00	34.94	40.43
Mar.	21.00	20.00	20.00	20.00	30.85	40.25
Apr.	20.20	20.00	20.00	20.00	35.40	40.25
May	20.00	20.00	20.00	20.00	30.38	40.25
June	20.00	20.00	20.00	20.00	33.88	40.25
July	20.00	20.00	20.00	20.00	38.45	40.87
Aug.	20.00	19.95	20.00	20.00	40.00	42.75
Sept.	20.00	18.25	20.00	20.00	37.75	42.75
Oct.	20.00	16.10	20.00	20.00	40.75	42.75
Nov.	20.00	17.13	20.00	23.94	41.88	42.75
Dec.	20.00	19.94	20.00	29.00	40.00	42.75
Average	20.36	19.29	20.00	21.08	37.13	41.36

	1949	1950	1951	1952	1953	1954
Jan.	$41.25	$29.95	$47.13	$43.00†	$43.00†	$30.25
Feb.	39.25	31.28	46.78	43.00†	43.75	27.25
Mar.	38.30	32.13	44.00†	43.00†	44.75	24.90
Apr.	24.94	33.00	44.00†	43.00†	42.63	26.50
May	23.00	37.75	44.00†	43.00†	39.00	30.25
June	22.00	44.50	44.00†	42.90	42.10	29.50
July	20.75	41.80	44.00†	40.45	46.75	29.50
Aug.	21.94	43.90	44.00†	43.00†	44.75	29.50
Sept.	27.35	43.75	44.00†	43.00†	39.30	31.00
Oct.	29.44	43.75	43.00†	43.00†	35.50	34.00
Nov.	31.95	43.75	43.00†	43.00†	37.25	34.20
Dec.	30.75	46.57	43.00†	43.00†	33.10	33.00
Average	29.08	39.16	44.21	42.78	40.99	29.90

* Price unchanged at $20.00 throughout 1942 and 1943.
† OPS basing point price ceiling.

MACHINERY CAST AT CHICAGO

No. 1 Scrap Delivered Per Gross Ton

	1939	1940	1941*	1946*	1947	1948
Jan.	$12.56	$14.00	$19.66	$20.00	$43.38	$66.00
Feb.	12.75	13.75	19.25	20.00	44.86	65.25
Mar.	12.75	13.56	20.75	20.00	46.00	66.00
Apr.	12.12	14.81	22.33‡	20.00	42.70	73.12
May	11.75	16.31	21.40	20.00	38.00	72.88
June	12.15	17.31	20.00	20.00	41.81	69.90
July	12.25	16.75	20.00	20.00	46.00	71.50
Aug.	12.25	16.88	20.00	20.00	49.38	74.38
Sept.	14.50	17.13	20.00	22.50	48.50	71.25
Oct.	16.07	17.75	20.00	25.50	51.00	68.87
Nov.	15.66	18.00	20.00	32.28	52.75	72.20
Dec.	14.50	19.13	20.00	41.86	60.30	69.50
Average	13.34	16.20	20.21	23.40	47.12	70.46

	1949	1950	1951	1952	1953	1954
Jan.	$57.25	$38.50	$63.00*	$52.00*	$40.63	$35.75
Feb.	48.00	39.00	52.00*	52.00*	46.90	36.20
Mar.	41.20	39.75	52.00*	46.63†	47.20	36.20
Apr.	29.63	41.50	52.00*	43.45†	45.63	39.38
May	27.90	48.75	52.00*	43.00†	42.38	41.25
June	25.00	47.25	52.00*	41.23†	43.30	40.80
July	30.75	43.90	52.00*	39.10†	48.83	39.50
Aug.	39.30	49.10	52.00*	44.90†	45.25	39.50
Sept.	42.25	50.25	52.00*	48.50†	39.20	41.25
Oct.	41.25	52.00	52.00*	48.90†	36.75	43.25
Nov.	32.88	49.38	52.00*	46.19†	38.50	42.50
Dec.	39.85	64.50	52.00*	43.30†	36.80	43.63
Average	39.00	47.86	52.92	45.18	42.73	39.74

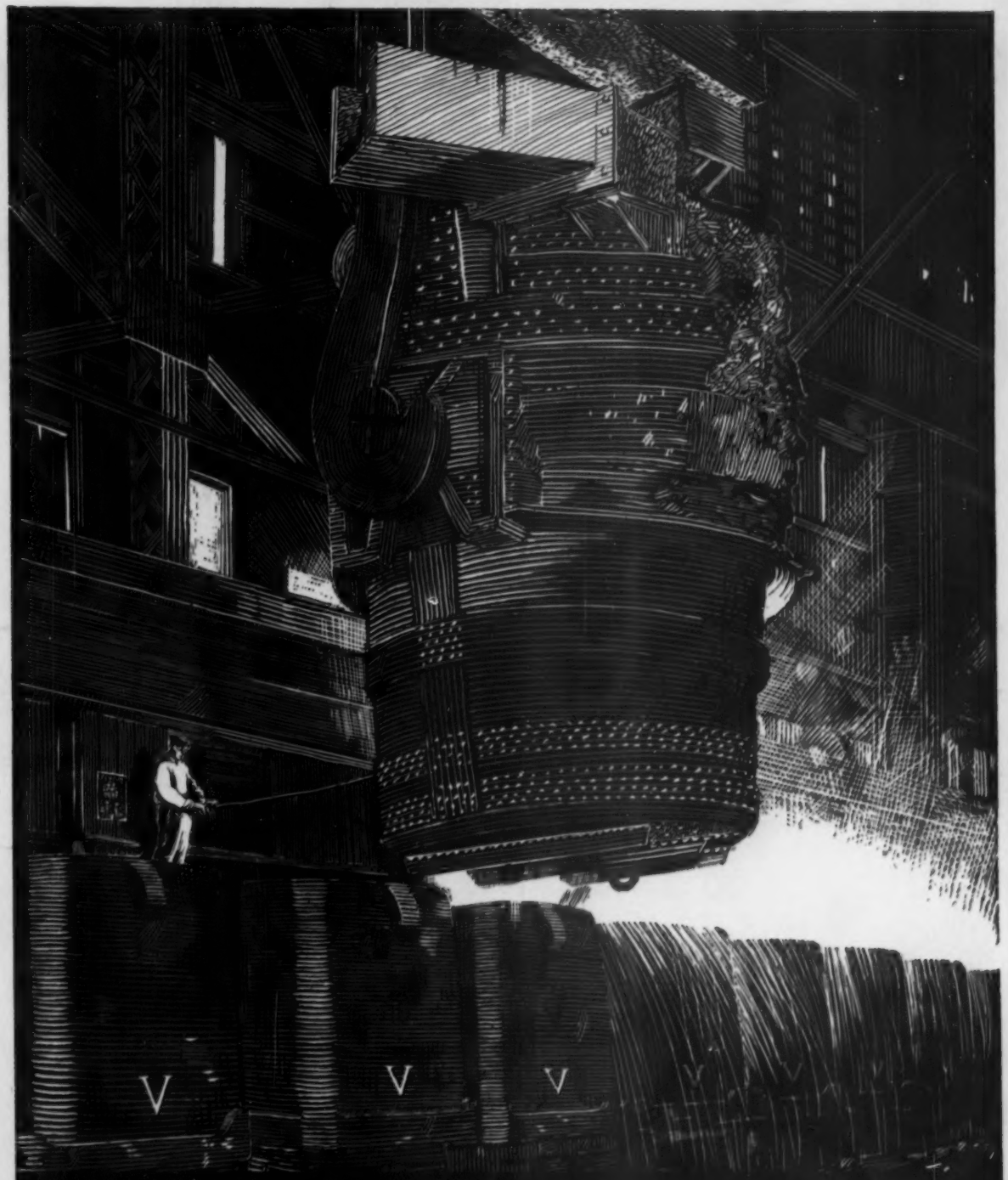
‡ Changed from net ton bases April 30, 1941.
* Price unchanged at $20.00 from 1942 through 1948. Ceiling prices do not include delivery costs.
† Delivered. Nominal $3 per ton deducted for shipping, commission to put prices on F.o.b. basis for comparison purposes.
* OPS ceiling shipping point prices.

CUPOLA CAST AT CINCINNATI

No. 1 Scrap Delivered, Per Gross Ton

	1948†	1950†	1951†	1952†	1953†	1954
Jan.	$60.00	$36.90	$65.50*	$49.00*	$48.00	$36.50
Feb.	49.00	35.75	49.00*	49.00*	48.75	36.50
Mar.	42.00	38.50	49.00*	49.00*	48.30	34.50
Apr.	32.00	40.50	49.00*	49.00*	44.00	35.25
May	27.50	44.90	49.00*	49.00*	41.75	36.00
June	23.30	46.75	49.00*	49.00*	41.50	36.90
July	25.50	46.50	49.00*	43.50‡	42.25	36.90
Aug.	29.88	49.10	49.00*	45.90‡	42.50	36.50
Sept.	36.50	53.50	49.00*	49.00*	42.10	36.50
Oct.	40.50	59.20	49.00*	48.00‡	41.25	36.90
Nov.	41.00	63.75	49.00*	48.00‡	37.50	39.90
Dec.	46.25	66.25	49.00*	48.00‡	36.90	39.50
Average	37.94	48.39	50.38	47.53	42.82	37.77

† Average of No. 1 cupola cast prices.
* Price unchanged at $20.00 from 1942 through 1948. Ceiling prices do not include delivery costs.
* OPS ceiling shipping point prices.
‡ Delivered. Nominal $3 a ton deducted for shipping, commissions to put prices on comparable F.o.b. basis under OPS system.



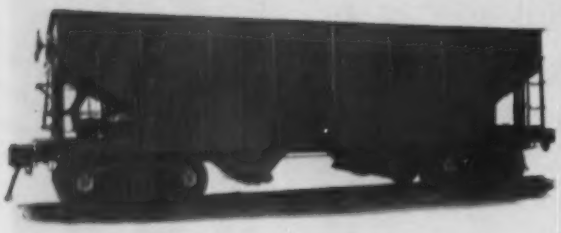
VALLEY MOULD AND IRON CORP.

General Offices: HUBBARD, OHIO

Western Office: Chicago, Ill. • Northern Office: Cleveland, O.

Available

FOR SALE *or* LEASE



50 TON TWIN CENTER DUMP HOPPER CAR

These all-steel cars are in excellent condition with all new bodies and center sills having been applied within the last ten years. Cars feature pressed steel hopper doors with Wine-type door locks and all modern attachments. They are well suited for mainline interchange or intraplant service. Prompt delivery.

PRINCIPAL SPECIFICATIONS

Capacity, Nominal	100,000 Lbs.
Load Limit, Average	131,000 Lbs.
Light Weight, Average	38,000 Lbs.
Length, Inside	30 Ft. 5 In.
Height, from Top of Rail	11 Ft. 1 In.
Width, Inside	9 Ft. 6 In.
Width, Extreme	10 Ft. 2 In.
Capacity, Level Full	1,683 Cu. Ft.

Complete Information on Request

5210

CHICAGO FREIGHT CAR... and parts company

CHICAGO, ILL. AUBURN, WASH. PUEBLO, COLO.

MAIN OFFICE: 228 N. LaSalle Street • Chicago 1, Illinois

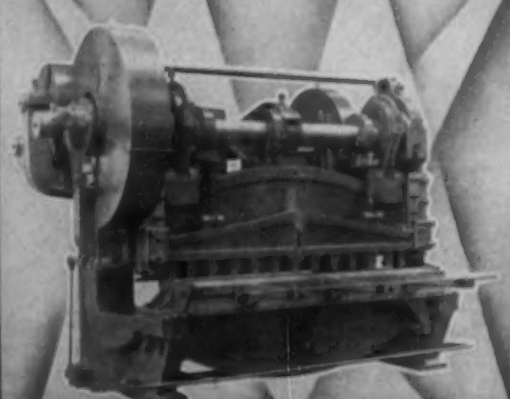
SHEET METAL and PLATE-WORKING MACHINES

A complete line of heavy machinery for punching, shearing and bending sheet metal and heavy plates. . . .

CORRUGATED CULVERT ROLL

PYRAMID TYPE PLATE BENDING ROLL, CAPACITY 1½"X12'

INITIAL PINCH TYPE PLATE BENDING ROLL, CAPACITY ½"X8'

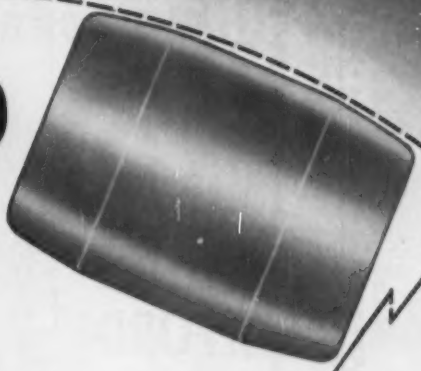


8'X¼" SHEAR, 30" GAP.

BERTSCH & COMPANY

CAMBRIDGE CITY INDIANA

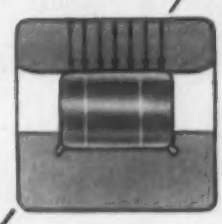
NOW... all Tru-Rol Bearings *have* CROWNED ROLLERS



● When a straight cylindrical roller bearing is under load, the highest stresses tend to concentrate at the roller ends. Stresses may become excessive and cause early bearing failure.

Crowning is a Rollway grinding refinement that adds a long radius curve to the roller ends. This relieves the high stress areas — allows the rollers to take heavier loads and reduces the effect of slight shaft misalignment or deflection. Bearings can be load rated at substantially higher values — provide a longer service life.

Crowning is but one of the many engineering advances built into Rollway Tru-Rol Bearings. Write for the complete story. Rollway Bearing Co., Inc., Syracuse, N.Y.



Crowned roller under full load — stress uniformly distributed.

Crowned Tru-Rol Bearings available in the following type:

Full Roller

Segmented Steel Retainer

Carefully selected crown radius, varying from 20" to 260", provides proper relief for normal loading to which bearing will be subjected.

+

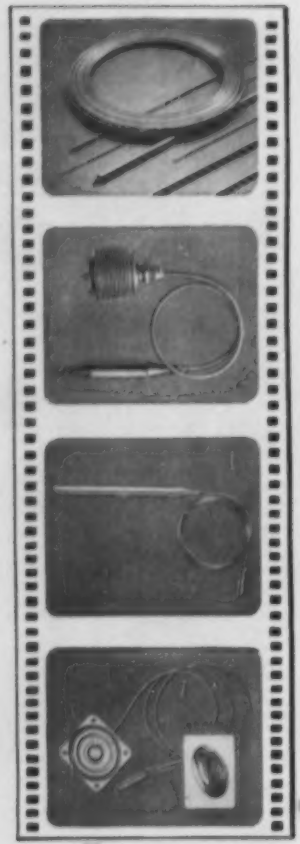
Stamped Steel Retainer with Guide Lips

New Rollway Tru-Rol Catalog features RBEC formula converted to simple nomogram. Send for your copy today.

ROLLWAY BEARINGS

COMPLETE LINE OF RADIAL AND THRUST CYLINDRICAL ROLLER BEARINGS

SALES OFFICES: Syracuse • Chicago • Toronto • Cleveland • Seattle • Philadelphia • San Francisco • Boston • Detroit • Pittsburgh • Milwaukee • Houston • Los Angeles



United Wire

In COPPER TUBING

It's

UNITED

COPPER CAPILLARY AND COPPER TUBING

for

CLIFFORD Bulb Assemblies

Famous CLIFFORD Bellows bulb assemblies have an enviable reputation throughout industry for holding to close tolerances and providing exceptional performance control.

CLIFFORD Manufacturing Company, Division of Standard-Thomson Corp., gives a lot of the credit for this record to UNITED Copper Tubing. Through years of use CLIFFORD has found the product quality in UNITED Copper Tubing unequalled. Capillary is delivered as called for *when* called for and tubing is clean and dry and easily workable.

CLIFFORD sums up by saying "we know we are getting the best copper capillary and copper tubing available in UNITED".

You Get The Best When You Specify UNITED Copper Tubing!

UNITED WIRE
AND SUPPLY CORP.
PROVIDENCE, RHODE ISLAND

Permanently United

SALES OFFICES

New York • Philadelphia • Newark • Hartford
Springfield • Rochester • Minneapolis • Pittsburgh
Lansing • Cleveland • Chicago • St. Louis • Los Angeles

CLEAN

BRIGHT

ACCURATE

STRONG

Clean, bright, accurate, strong—that's the story of Ritco Drop Forgings. We produce parts to your blueprint in steel or non-ferrous metals, in weights from 1/4 lb. to 15 lbs.

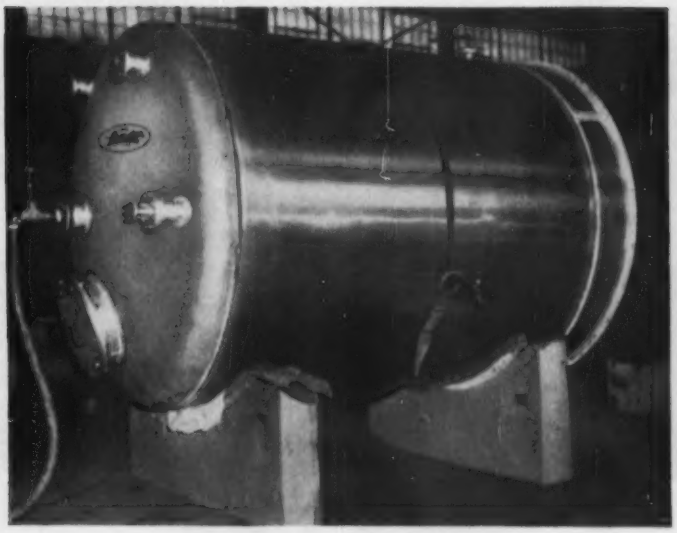
Come to Ritco for Drop Forgings, special fasteners, and finished bolts with regular or heavy heads. Also, take advantage of our complete facilities for finishing — machining and grinding. Send blueprints and specifications for free estimates.

Rhode Island Tool Company,
148 West River Street,
Providence 1, Rhode Island.

RITCO

Exclusive New England Representatives for Cleveland Cap Screw Co.

RADIOGRAPHY makes positive



about negative pressure

Specifications for this tank—designed to operate from vacuum to 25 pounds' pressure—called for welded 2S aluminum. This, as welders know, could cause problems. But the builders called on radiography. Here is what they say:

"X-rays played a very important part in the extensive research to determine the most suitable method of welding the vessel. Without the use of x-ray we might never have obtained the high quality and uniform results."

Which shows two important facts. First, that radiography proves the soundness of welds. Second, that it expands the use of the welding process.

This is good reason that today more and more welders make use of radiography. If you would like to know how it can help your business, get in touch with your x-ray dealer and talk it over.

EASTMAN KODAK COMPANY
X-ray Division, Rochester 4, N. Y.

Radiography...
another important example of Photography at Work

Kodak

OLSON

MANUFACTURING COMPANY

100 PRESCOTT ST., WORCESTER 5, MASS.

Representatives: New York • Philadelphia

Screw Machine Products since 1913

1/8" to 2 5/8" CAPACITY

STEEL • BRASS • ALUMINUM

QUALITY . . . . . DEPENDABILITY . . . . . EXPERIENCE

CAD

FOR MACHINE TOOLS

Standardized set-up appliances

Why Force Your Men **to waste time on machine tool set-ups when CAD Standardized Appliances will convert this non-productive time into productive labor?**

Why Ruin Machine Table Slots **with ordinary bolts when CAD Bolts are designed to fit T Slots?**

The CAD Bolt is a standard machine table bolt, made of steel with full threads, *ready for use when you receive it.*

WRITE TODAY FOR BULLETIN A-85

STANDARD SHOP EQUIPMENT CO.

SET-UP APPLIANCES FOR MACHINE TOOLS

8172 Tinicum Ave., Philadelphia 42, Pa.

EASTERN TOOL AND STAMPING CO., Inc.

Typical example of 1-piece stamping from ⅛" thick by 7¾" diameter brass blank.

Here is a one-piece stamping that makes up into a hand stapler part.

STAMPING SPECIALISTS IN DEEP DRAWING WORK - ALL METALS - ALL INDUSTRIES

Brass Box—5" deep—14" square—17⅜" Flange.

Spring tempered phosphor bronze contact—note flat foldback feature.

Aluminum Casing — 4¾" deep — 9⅛" wide—16¾" long.

Steel Machinery Part—7¼" deep —10" dia.

Headlight—6¼" deep—7¾" O.D.

Notice the reduction in this 4⅛" long by ½" O.D. tube with 1⅛" flange.

ETS **EASTERN TOOL AND STAMPING CO., Inc.**

PRESSED METAL ENGINEERS
DIES AND STAMPING
110 BALLARD ST., SAUGUS, MASSACHUSETTS

To Your
SPECIFICATION
COLD ROLLED STRIP STEEL
by GRIFFIN

For the last half century, Griffin cold rolled strip steel has been used profitably by hundreds of manufacturers. They have found that they can rely on Griffin to fill their specifications to gauge, temper, size, finish, length, and edges.

Consult with us on your next cold rolled steel requirements.

CHARLES L. LEWIS
2450 17th St., San Francisco 10, Cal.

W. H. LEONORI & CO., INC.
30 Howard St., New York 13, N. Y.

J. J. LAMBERT
323 Huntington Ave., Buffalo, N. Y.

JOHN E. LOVE
2832 E. Grand Blvd., Detroit 11, Mich.

CENTRAL STEEL & WIRE COMPANY
13400 North Mt. Elliott, Detroit 12, Mich. — 3000 West 51st St., Chicago 80, Ill. — Box 148 Annex Station, Cincinnati 14, Ohio

GRIFFIN
Manufacturing Company
ERIE, PENNSYLVANIA

NICKEL in IRON and STEEL

By A. M. HALL, Battelle Memorial Institute

The second publication in the Alloys of Iron Research NEW MONOGRAPH SERIES, Frank T. Sisco, Director and Editor.

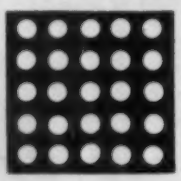
Modern metallurgy's most important alloying metal here receives skillful and thorough treatment. Covers such vital topics as: the thermal and physical properties of steels containing nickel; the structure and heat treatment of wrought and cast nickel steels; the effect of nickel on all important engineering properties of steel, at normal, high and low temperatures; corrosion; the selection of the right steel for a particular purpose; the effects of nickel on cast iron; and many others.

1954 · 596 pages · Illustrated · $10.00

Send for your ON-APPROVAL copy today

JOHN WILEY & SONS, Inc.
440 Fourth Avenue
New York 16, N. Y.

metal perforating?
let **WISSCO** *do it*

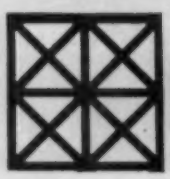


promptly... efficiently ... economically

We are completely equipped to handle all your metal perforating needs. Any metal—stainless and carbon steel, monel, copper, brass, bronze and aluminum.

Our facilities include extensive stock of standard and special dies. Special die-making, rolling, forming, shearing, welding and assembling equipment is available.

We can furnish stock to be perforated or it may be supplied by you.



WICKWIRE SPENCER STEEL DIVISION OF CF&I —
Atlanta • Boston • Buffalo • Chicago • Detroit
New Orleans • New York • Philadelphia

WISSCO
PERFORATED METALS
CF&I

Why Granite City Steel is growing 3 times faster than the industry!

He makes your order his personal affair

He is the Granite City Steel salesman. He knows the steelmaking business. Before he can handle your account, he must know exactly why, how and when you use steel in *your* business. He combines these knowledges into a more personal, more intelligent service on your sheet steel orders than you can expect from most other mills.

Backing up this highly personalized service is one of the world's most modern, fully integrated mills, for 77 years specialists in the production of quality flat-rolled steel for Middle America. We urge you to make your own first hand judgement of the extra benefits of Granite City Steel service. Sales offices in St. Louis, Kansas City, Minneapolis, Memphis, Dallas, Houston, Tulsa.

GRANITE CITY STEEL
GRANITE CITY STEEL COMPANY
Granite City, Illinois
GRANCO STEEL PRODUCTS CO.
A subsidiary of Granite City Steel Co

Turn Pipe Dreams Into Pipe Bends!

Pipe, tube and structural bending is now simplified with a PEDRICK PRODUCTION BENDER. Heretofore difficult bends, such as offsets and off-plane bends, can now be made in production quantities at an amazingly low cost.

ALL PEDRICK PRODUCTION BENDERS are complete with motor, and are equipped with automatic duplicate bending relays.

Prices start as low as $1575.00

(Motor and all Electrical Equipment included)

Write for Descriptive Folder. Dept. 2

PEDRICK TOOL & MACHINE CO.

3640 N. Lawrence St.

Phila. 40, Pa., U.S.A.

SERVICE FOUNDRY

geared to perfection

. . . to serve the exacting requirements of industry. The skill, care, precision and experienced workmanship of Service Foundry engineers and craftsmen have made the name famous the world over . . .

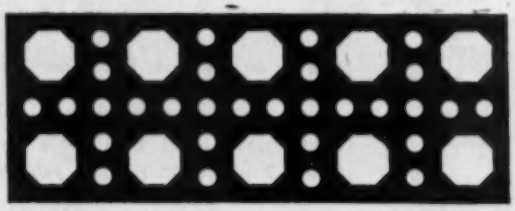
SERVICE FOUNDRY a division of **AVONDALE MARINE WAYS, Inc.**

416 Erato Street, New Orleans, U. S. A. P. O. Box 1030, New Orleans, U. S. A.

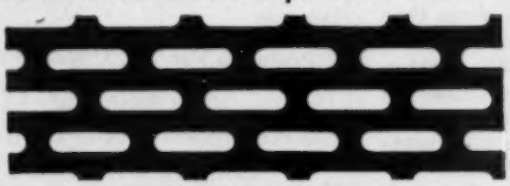
Cable Address: "Serfdry"

DIAMOND PERFORATED METALS

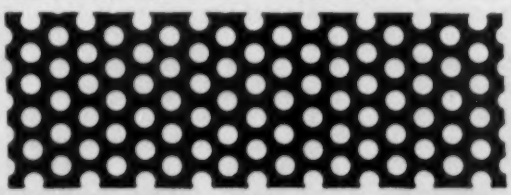
. . . the first choice among designers. "If it requires HOLES—whether rounds, slots or special ornamental arrangements — contact DIAMOND."



Product-Design Engineers have learned about Diamond's cooperation on development of special items. Passed along to Purchasing Departments, for actual ordering, your organization becomes acquainted with what Diamond Service to Manufacturers really means.



Geared to produce Perforated Metal in any quantity — for America's leading industrial concerns — that's DIAMOND.



Want to know more about us and what we might do for you? Write for Cat. 39.

DIAMOND MANUFACTURING CO.
Box 41 WYOMING (Wilkes-Barre Area) PENNA.

REPLACE COSTLY HIGH ALLOY STEELS!

The Amazing — New

Alumicoat PROCESS

LICENSED UNDER GENERAL MOTORS CORPORATION PATENT NO. 2,569,097

Metallurgically Bonds ALUMINUM to STEEL!

Protects Carbon and Low Alloy Steels From High Temperature Oxidation!

Now available for the first time, the ALUMICOAT Process protects steel and its alloys from both chemical and elevated temperature corrosion by metallurgically bonding aluminum or its alloys to the ferrous metals!

In many cases, costly high alloy steels can be replaced with less costly alloy steels which have been given the required resistance to oxidation and corrosion through the ALUMICOAT process!

Typical applications of the ALUMICOAT process include jet aircraft components, exhaust manifolds, boiler hot air tubes, diesel engine components, chemical equipment parts, petroleum refinery parts, etc.

3 STEPS TO PROTECTION AGAINST CORROSION and HEAT OXIDATION

1. CLEANING — Areas to be bonded are thoroughly cleaned.

2. FLUXING — Proper bonding is assured by fluxing with a patented salt bath process.

3. DIPPING — Parts are dipped in molten aluminum to produce a metallurgical iron-aluminum alloy bond at the interface, plus an aluminum protective coating.

Write today for brochure and complete information.

ARTHUR TICKLE ENGINEERING WORKS, INC.

21-22 Delevan Street MAin 5-4200 Brooklyn, N. Y.

RAILWAY EQUIPMENT FOR SALE

Used - As Is - Reconditioned

Immediate Delivery

50-Ton All-Steel GONDOLA CARS

RAILWAY CARS
All Types

"SERVICE-TESTED"

FREIGHT CAR REPAIR PARTS
For All Types of Cars

LOCOMOTIVES
Diesel, Steam, Gasoline, Diesel-Electric

RAILWAY TANK CARS and STORAGE TANKS
6,000- 8,000- and 10,000-Gallon Cleaned and Tested

CRANES
Overhead and Locomotive

RAILS
New or Relaying

IRON & STEEL PRODUCTS, Inc.

General Office
13496 S. Brainard Ave.
Chicago 33, Illinois
Phone: Mitchell 6-1212

New York Office
50-b Church Street
New York 7, N. Y.
Phone: BEekman 3-8230

"ANYTHING containing IRON or STEEL"

THE CLEARING HOUSE

News of Used and Rebuilt Machinery

Review Past Year . . . 1954 was the year that used machinery dealers from coast to coast went through the well-known wringer. For some, latecomers to the business, or those whose stocks had been purchased at higher than average prices, the pressure was pretty heavy. A few unlucky firms got squeezed out.

Statistics gathered by Machinery Dealers National Assn. from nearly 100 representative dealers scattered throughout the East, Midwest and West Coast indicated that as far as the first three quarters were concerned the average dealer's dollar volume was off 25 pct or more. But sales figures sometimes make things look a little better than they were. For those whose 1954 stocks were purchased at the previous year's peak prices, a dollar volume drop of 30 pct would be a somewhat conservative estimate.

West Off Less . . . Used equipment dealers in the Far West seemed somewhat less afflicted by last year's business drop than firms in other sections of the country. Probable reason: the uninterrupted industrial expansion in California and the Pacific Northwest which has kept small subcontract shops busy.

Auctions More Important . . . Auctions became a bigger factor in the used machinery picture in 1954 as an unusually large number of plants pared off excess tools purchased for all-out production during the Korean emergency.

A growing tendency for bargain-hungry firms, made suddenly budget conscious by last spring's recession, to attend auctions sometimes saw a dealer bidding against a former customer for a good used machine. Last summer's auction of equipment at the Kaiser-Willys plant in Ypsilanti, Mich., proved a prime example.

In the interest of keeping member firms informed as to prices and transactions at auction sales throughout the nation MDNA instituted a plan for its chapters to assign a member to cover every auction and forward the price of each major machine tool to MDNA headquarters so that mimeographed listings of sales could be issued to all members.

Rebuilders Fared Better . . . The machine tool rebuilding business slumped somewhat after the second quarter but overall took less of a downward slide than did industry as a whole. Rebuilders got a steady source of revenue from small shops which needed but could not afford new tools and found a precision rebuild job the answer to their problems.

A probable source of additional revenue for rebuilders in 1955 lies in the Army Ordnance tool rebuilding program (THE IRON AGE, July 8, p. 154). At present contracts are being readied and announcement of actual inspection and bidding should come early in the year.

Prospects For '55 . . . Most dealers are viewing the new year in a mood of "cautious optimism." They feel that the shakeout of the last 12 to 18 months has run its course. There have been reports of some increases in inquiries and sales during the final quarter. Dealers in the Detroit and Chicago areas see a definite upturn in the offing, feel almost positive that January will better December due to the effect of the holiday slump.

However, as can be expected of a characteristically pessimistic industry after one of its toughest "off years" there's no wave of bullish feeling. Nobody's getting out on a limb by predicting his business will be 20, 10 or even 5 pct better in the year to come. Though looking ahead with an open mind at 1955, the industry is keeping its fingers crossed.

CONSIDER GOOD USED EQUIPMENT FIRST

SPECIALIZING IN EQUIPMENT FOR THE FOLLOWING ENUMERATED INDUSTRIES

PLATE WORK and FABRICATING, Including STRUCTURAL, BOILER and TANK PLANTS
RAILROADS; SHIPYARDS; STAMPING PLANTS; MACHINE SHOPS; POWER PLANTS
WIRE EQUIPMENT for WIRE INDUSTRY, DRAWING, FINISHING, FORMING
ROLLING MILLS, Steel and Non-Ferrous Metals, Hot and Cold
Equipment for FORGING INDUSTRY
BOLT and NUT MACHINERY

ACCUMULATORS
AIR COMPRESSORS
- Direct Motor & Belted
- Motor Driven
- Oil & Gasoline Driven
- Steam Driven
- Centrifugal

BALING MACHINES
BENDERS (Hydr. & Mech.)
BENDING ROLLS (Plate)
- Pyramid & Initial Type

BOLT & NUT MACHINERY
BORING MILLS
- Car Wheel
- Horizontal
- Vertical

BRAKES
- Press & Leaf Type

BUILDINGS
BULLDOZERS
CRANES
- Overhead Electric Travel
- With Runways
- Gantry
- Ladle
- Locomotive
- Mono Rail
- Ore Cranes & Bridges
- Pit
- Wall

DIE SINKING MACHINES
DRAW BENCHES
ELECTRICAL EQUIPMENT
- Generators
- Mill Drive Motors
- Transformers
- Turbines

FORGING EQUIPMENT
- Forging & Upsetting Machines
- Hammers
- Taper Forging Rolls

FURNACES
- Annealing
- Melting, Nonferrous & Heat Treating

GRINDERS
- Cylindrical
- Surface

HEADERS (Hot & Cold)
KEY SEATERS
LATHES—Large Sizes Only
- Axle
- Roll
- Wheel

LEVELLERS
- Roller
- Stretcher

LOCOMOTIVES
- Gas
- Electric
- Steam

MAGNETS
- Lifting

MILLING MACHINES
- Planer Type
- Plain & Universal

NIBBLERS
PIPE MACHINES
PLANERS
- Closed Housing
- Open Side
- Plate
- Rotary—Column Facer

PRESSES
- Embossing & Coining
- Gap Frame
- Inclinable Bed
- Screw
- Straight Side
- Toggle Drawing
- Trimming

PRESSES—HYDRAULIC
- Flanging
- Forging
- Wheel

PUMPS
- Hydraulic—High Pressure
- Underwriters Fire
- Vertical Triplex

PUNCHES
- Combination Punch & Shear
- Multiple—With Spacing Table
- Beam
- Horizontal

RIVETERS
ROLLING MILL EQUIPMENT
- Sheet
- Strip
- Bars & Shapes
- Plate
- Hot & Cold
- Gear Reduction Units

ROLLS
- Angle Bending
- Corrugating
- Forming
- Plate Straightening

ROTARY CONVERTERS
SAND BLAST EQUIPMENT
SAWS (Metal Working)
SCALES
SHEARS
- Alligator
- Angle
- Bar
- Billet
- Gate
- Rotary
- Squaring
- Slitting

SLITTERS
SLOTTING MACHINES
SPIKE MACHINES
STOKERS
STRAIGHTENERS—For Wire and Bar Stock
- Rounds & Shapes

SWAGING MACHINES
TESTING MACHINES
THREAD ROLLERS
WELDING MACHINES
WIRE MACHINERY
- All Types

• Manufacturing • **A. T. HENRY & COMPANY, INC.** • Equipment •

50 CHURCH ST., NEW YORK CITY 8
Telephone COrtlandt 7-3437

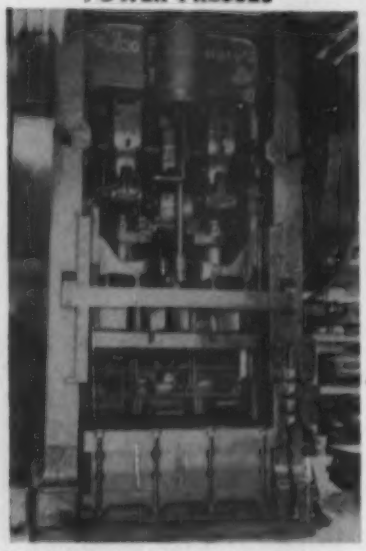
Confidential Certified Appraisals
Liquidations — Bona Fide Auction Sales Arranged

Consulting Engineering Service
Surplus Mfg. Equipment Inventories Purchased

MOST DIVERSIFIED STOCK IN COUNTRY

"If It's Machinery, We Have It"

POWER PRESSES



BLISS-TOLEDO NO. 96¾—72 DOUBLE CRANK PRESS 600 TON — BED 72" x 55"—TIE ROD FRAME CONST. AIR CUSHION ° AIR CLUTCH ° AIR COUNTERBALANCE STROKE 14"—SHUT DIE HEIGHT 36" POWER RAM ADJ.

DOUBLE CRANK

BLISS No. 7 with Dial Feed
NIAGARA No. 698X, 125 ton, bed 42" x 36", stroke 4", M.D.
CLEVELAND 66G72 Gap Frame, Bed 96" x 24", 150 ton
TOLEDO 9SC Bed 40" x 60" RL, 8" Stroke
TOLEDO 9SC Bed 40" x 60" RL 8" Stroke Tie Rod Frame, 250 Ton, Air Clutch
FERRACUTE SG, 106, Bed 42" x 84", RL, 100 Ton
CLEVELAND 45-D-60, 60" x 40" Bed, 3½" stroke
MINSTER 50-4-60, Bed 25" x 60", Motor Driven

GAP FRAME AND DEEP THROAT

3—TOLEDO No. 77A Gap Frame-Geared, bed 20" x 36", 12" Stroke. Friction Clutch.

BLISS No. 31, 58, 61 & 62, M.D.
BLISS-STILES No. 2, 3, 4 & 5. No. 2C & 3C
FERRACUTE P-1, P-2, P-3, P-4, P-5, & PG-4, M.D.
TOLEDO Nos. 15 & 17 Deep Throat

DOUBLE ACTION—CUT & DRAW

ADRIANCE Nos. 44, 45 & 46 Strip & Roll Feeds
ADRIANCE 16 Die Crown Cap Press
BAIRD Nos. 2 & 3 Tandem Roll Feed Transfer
BLISS No. 1, 1½B, 3½, 5 & 6 Cam & Crank
WATERBURY-FARREL Nos. 1, 2, 2½, Feeds
BLISS Nos. 68N and 69N O. B. I.
BLISS No. 822 Strip Feed Presses

KNUCKLE JOINT & PERCUSSION

BLISS No. 4, 22K, 25K, Knuckle Joint Press
FERRACUTE Nos. E51—75 Ton, and EG54—400 Ton
WATERBURY 320 Ton, Geared, Steel Frame
WATERBURY 25 Ton, Flywheel
ZEH & HAHNEMANN Nos. 7, 8½, 10 & 12 Percussion

WILLIAMS & WHITE 29U BULLDOZER

HORNING & WIRING

ADRIANCE, CALLAHAN—Nos. 23, 24 & 25
BLISS Nos. 2A, 4A & 5A Adj. Bed
BLISS Nos. 16, 39, 40 & 41 Adj. Tables
FERRACUTE Nos. CA-4 & CAG-4 M.D.
FERRACUTE No. PA-4 & PA-5 End Wheel Type

EYELET & TRANSFER PRESSES

WATERBURY-FARREL No. 156 & 158 Cam Type No. 4600 Ammunition Type Transfer Pres
WATERBURY-FARREL 12 Station, 11½" stroke Multiplunger Transfer Press

POWER PRESSES

TOGGLE DRAW PRESSES

FERRACUTE SD-703 DOUBLE ACTION TOGGLE DRAW PRESS, 700 TON CAP. BED AREA 60" F.B. x 72" L.R.; STROKE OF PLUNGER 40", STROKE OF BLANKHOLDER 20", 100 H.P. MOTOR

BLISS Nos. 1½, 1½B, 3½A, 3½B, 3½C, 3¾, 55
GARRISON, 500 Ton 12" shaft, 48x64 bed, single crank

INCLINABLE (O.B.I.)

BLISS Nos. 18, 19, 19C, 20, 20B, 21, 21½, 23 & 28
FERRACUTE C2, C3, C4, C5
V & O Nos. 00, 0, 01, 1, 2, 4, 101, 102, 103 & 104, Flywheel & Geared, with Dial & Roll Feeds
NIAGARA A1¼, A2, A3, A3½, A4

STRAIGHT SIDE, SINGLE CRANK

HENRY & WRIGHT 10, 25, 60, 75 TON DOUBLE ROLL FEEDS & SCRAP CUTTERS, M.D.

BLISS Nos. 37½, 52, 74½, 75½, 76½, 77½, 79½, 503½ & 505W. Geared & Flywheel with Air Cushions. Some with Side Shears for Forge Work
BLISS No. 307½ equipped with tooling for aluminum extrusion
FERRACUTE E-3 & E-4 with Roll Feeds
FERRACUTE DG-53 & DG-54 Geared
FERRACUTE DGG-56-36" stroke Deep Draw Press
NIAGARA No. 510 Geared with Side Shear
TOLEDO No. 59¼, Twin Flywheel Forging, 400 Ton

BLISS No. 88, 255 Ton Capacity, 18" Stroke

VERSON 800 TON KNUCKLE JOINT PRESS with Air Clutch, Tie Rod Frame, Motor Driven Ram Adjustment, Direct Motor Driven with 25 H.P. Stroke of Slide 4", Distance Between Housings 36", Equipped with Dial Feed. Practically New

ROLLING MILLS

AJAX 3 HI 3 STAND ROD & BAR MILL FLAK SEALED REDUCER, GE 4 SPEED AC MOTOR.

STANDARD 5"x8", 10"x14" ROLLER BEARING, SEALED, WATERBURY 10"x14"—Two High
McWILLIAM & RUESCH JEWELERS ROLLS
UNITED ENGINEERING 6" x 14" & 8" x 10"
STANDARD 12" x 20"
WATERBURY 12" x 12" Close-Coupled Mill
NEWBOLD 3 High—20"x30"

LEWIS 28" x 54" FACE ROLLING MILL, MOTOR DRIVEN, SCREWDOWN, SEALED GEAR REDUCTION DRIVE

BOLT, SCREW, NUT & RIVET EQUIP.

WATERBURY-FARREL TRIPLE STROKE OPEN DIE, CAPACITY ½" x 6" (Like New).

WATERBURY No. 6 Solid Die Header, ⅝" x 4"
WATERBURY No. 3 Dbl. Str. Open Die ½" x 6"
MANVILLE No. 312C—5/16 Cap. with Ajax Hogue Wire Drawers
WATERBURY-FARREL No. 2-¼" Cap. No. 3½-½" Cap. No. 5-⅝" Cap. Double Stroke, Solid Die, Cold Headers
WATERBURY-FARREL 5/16" Cap. and ½" Cap. Double Stroke. Open Die Cold Headers
WATERBURY & MANVILLE Double & Single Stroke Cold Headers, Capacities 1/16" to ⅝" ROD HEADERS ¼" & ⅜" Capacity
Nos. 1 & 2 Auto. Screw Slotters
MANVILLE Auto. Wood Screw Machines
WATERBURY-FARREL Nos. 0, 10, 20, 30 & 50 thread Rollers, Hand and Hopper Feed, M.D.
NATIONAL 3/16", ¼", ⅜", ½" Auto. Bent Shank Nut Tappers (Standard & Precision)
NATIONAL 8 Spindle 1" Tapper, M.D.

MISCELLANEOUS

AMERICAN 36"—H 9 Ton Broach, 1943
Chambersburgh 2500 lb. & B&S 1200 Board Drop Hammers
STANDARD Automatic Drop Hammers 1, 2, 3, 4 & 5
CAMPBELL No. 401 Cutomatic, New in '42
HIGH SPEED Hammers Nos. 1½B, 3A, 4A, & 5A
LANDIS 1" Pipe & Bolt Threaders
PRODUCTION MACH. Tube Polishers, Centerless
SHERIDAN 42" & 44" Die Presses

WIRE WORKING

BAIRD, NILSON, MANVILLE FOUR SLIDES, Nos. 0, 1, 2, 3, 4, 5, 3-20, 4-26, M.D. WIRE AND STRIP FORMERS (NEW AND USED)
U. S. TOOL Nos. 22 & 33 Multi-Slides, Reeves
BLISS & TOLEDO Automatic Ring Machines
SLEEPER & HARTLEY UNIVERSAL SPRING COILERS Nos. 0, 1, 2, 3, 3½, 4 & 5
SLEEPER & HARTLEY No. 319 Casting Coilers
SLEEPER & HARTLEY No. 1 & 2 Torsion Coilers
WELLS SPRING MACHINERY, COILERS, KNOTTERS & CRIMPERS, PIGTAIL MACH., LINK FABRIC MACH.
LEWIS, SHUSTER, WELLS AUTOMATIC WIRE STRAIGHTENER & CUTTING MACHINES, CAPACITY 1/16" to ⅛"
NILSON & BAIRD CHAIN MACHINES
NATIONAL & PERKINS Nail Machines
MORGAN 4 Block Continuous Wire Drawing Machine (22" Blocks)
VAUGHN Nos. 8, 10 & 12 Motorblocs, M.D.

WATERBURY WIRE DRAWING EQUIP. BULL BLOCKS, HORZ. & VERTICAL NOS. 0-7 DIE SLEEVE TYPE FOR ALUM. & COPPER NOS. 1, 2, & 3 UPRIGHT ROLL—7 DIE

STANDARD, TORRINGTON, LANGELIER, ETNA WIRE & TUBE SWAGERS Nos. 1, 2, 3, 4 & 5
ETNA Nos. 103, 154, S204, 308 & 412 Swager
TORRINGTON Nos. 1, 2, 3½, & 4 Swager

MACHINERY FOR THE PRODUCTION OF WIRE SPECIALTIES, WIRE STAPLES, HAIR & BOB PINS, PAPER CLIPS, STRAIGHT & SAFETY PINS, NAILS, WIRE BASKETS & WIRE GUARDS.

MACHINE TOOLS

BORING MILLS

CLEVELAND 2½" Bar Horiz. M.D.
UNIVERSAL 3" Bar M.D.
NILES 10' Vertical, 2 Heads
LUCAS No. 31 Table Type

PLANERS

CINCINNATI 36" x 36" x 16' M.D.
WOODWARD & POWELL 42" x 42" x 36' M.D.
NILES-BEMENT-POND 60" & 20' M.D.

INGERSOLL PLANER TYPE MILL, 4 HEADS & SLABBING SPINDLE 36" x 24" x 16'

METAL WORKING

POWER SHEARS

NIAGARA No. 2120—10' x 14 Gauge
CANTON FOUNDRY 11' & 14 Ga. Power Shear
PELS HEAVY DUTY BEAM SHEAR, CAPACITY UP TO 12" Beam or Channel at one stroke
BLISS, NIAGARA, QUICKWORK, MARSHALLTON DEEP THROAT & THROATLESS Shears
NIAGARA No. 216B Circle Shear
D & K No. 1 Alligator Shear, A.C. M.D.

HALLDEN 24" STRIP STRAIGHTENER & AUTOMATIC CUTOFF M.D.

SLITTERS

BLISS Nos. 225, 225A, 235 & 315 Gang
WATERBURY Nos. 0, 1, 2, & 3 Gang

ROLL LEVELLERS

McKAY 18" face x 7" dia. rolls (1941)
WATERBURY 24" face x 2½" dia. rolls

ROLL FORMERS

KANE & ROACH 15 STAND 36" WIDE

RAFTER 7 Head Tube Former
RAFTER 5 Head Tube Former
PITTSBURGH 4 & 5 Head Tube Formers
MAPLEWOOD Tooled for Curtain Rods
YODER 5 Head with Flying Shear
RAFTER 10 Stand 2½" Dia., Spindles, M.D.

POWER PRESS BRAKES

CHICAGO ½" x 6' Box & Pan Brake, M.D.
KNIGHT 3' Power Brake extra dies. (All-Steel)
ROBINSON 12' Corrugating Brake
CHICAGO 4L6 10 Ga. Cap.

Our Stock Is Always Changing and We Solicit Your Valued Inquiries

NATIONAL MACHINERY EXCHANGE

128 MOTT STREET NEW YORK 13 N. Y. Cable: NATLMACHEX Phone: CAnal 6-2470

THE CLEARING HOUSE

EMERMAN *Offers from* STOCK

FOR SALE OR RENT

7" Giddings & Lewis Type 345 Horiz. Boring & Milling Machine
Serial No. P-4000

Diameter of spindle 7"
Traverse of spindle 72"
Spindle speeds No. 24
Range of spindle speeds 1 to 122 RPM
No. feeds 8
Range of feeds .000" to .315"
Vertical travel of head 96"
Horiz. travel of column 20'
Equipped with: Power rapid traverse
25 H.P., 230 volt, DC motor
Starting equipment

ENGINE LATHES

14"x30" Hendey, Ser. 33768, Timk. Bear., Chucks, Comp. Elecs., 1943
14"x54" Hendey, Ser. 30942, T.A., Timk. Bear., Chucks, Comp. Elecs., 1941
16"x30" Hendey, Ser. 31711, Timk. Bear., Chucks, Comp. Elecs., 1942
20"x68" Springfield, Timk. Bear., Chucks, Comp. Elecs., 1938
20"x78" Monarch, Timk. Bear., Chucks, Comp. Elecs., 1934
20"x68" Prentice Geared Head, Timk. Bear., Chucks, Comp. Elecs., 1922
20"x48" American Geared Head, T.A., Chucks, Comp. Elecs., 1921
(2) 20"x48" Americans, Ser. 61926-61967, Timk. Bear., Chucks, Comp. Elecs., 1940
20"x72" Springfield, Ser. 970, Timk. Bear., Chucks, Comp. Elecs., 1938
20"x96" Lodge & Shipley, Ser. 31068, T.A., Timk. Bear., Comp. Elecs., 1941
20"x91" Axelson, Ser. 945, Timk. Bear., Chuck, Comp. Elecs., 1940
22"x54" Monarch, T.A., Timk. Bear., Chucks, Comp. Elecs., 1934
22"x48" Monarch, T.A., Chucks, Comp. Elecs., 1942
24"x168" Monarch, Ser. 16068, Timk. Bear., Rapid. Tra. Chucks, Comp. Elecs., 1942
24½"x336" Monarch, Ser. 6806, 2-T.A., Timk. Bear., 2-Carriages, Rap. Tra. Comp. Elecs., 1940
26"x10' Bridgeford, 1917
27"x124" Lodge & Shipley, Ser. 33749, T.A., 4-way tool post, live center tailstock, Timk. Bear., Compl. Elec., 1942
28"x282" Betts-Bridgeford, Ser. E-5218-6, 2-Carriages, 2-Taper Att. Rap. Tra., Comp. Elecs., 1941

(9) No. 12 Gisholt Auto., Ser. 3012-4, T.B., Front & Rear Slides, Comp. Elecs., 1941
13"x17" LeBlond Rapid Prod., T.B., Lever Operated Tailstock, 1943
(2) 15"x30" Lipe Carbomatic, Ser. 2066-43, Front & Rear Slides, Tailstock, T.B., Comp. Elecs., 1943
No. 16 LeBlond, Front & Rear Slides, T.B., Tailstock, Comp. Elecs., 1940
6A Potter & Johnston, 1925
(4) 16"x30" Fay Auto., Ser. 81467, Front & Rear Slides, Hyd. Oper. Tailstock, Comp. Elecs., 1943
20"x25" Fay, Front & Rear Slides, Comp. Elecs., Lever Operated Tailstock, T.B., 1947
24"x42" Fay, Ser. 7495, T.B., Front & Rear Slides, Air Operated Tailstocks, Comp. Elecs., 1942
No. 5D P&J, Ser. 54207, 6-Station Turret, T.B., Well Tooled, Comp. Elecs., 1942
No. 5DE P&J, Ser. 54213, 5-Station Turret, T.B., Well Tooled, Comp. Elecs., 1942
(3) No. 5D-2 P&J, Ser. 53747, 2-Spindle, T.B., Comp. Elecs., 1942

CHUCKERS

(2) 8" Acme Gridley, Ser. 57013, 6-Power Chucks, Comp. Elecs., 1938

TURRET LATHES

(4) No. 3 Gisholt, Ser. 2839-38, Bar Feed, 4-way tool post, T.B., Misc. Turret Tooling, Chuck, Comp. Elecs., 1943
No. 3 W&S, Ser. 558919, T.B., Chucker, 4-way tool post, Comp. Elecs., 1940
No. 4 W&S, Hyd. Pre-Select Head, Bar Feed, T.B., Misc. Tooling, Comp. Elecs., 1942
No. 4 Gisholt, Ser. 2854-38, Chucker, T.B., 4-way tool post, Misc. Tooling, Comp. Elecs., 1944

TURRET LATHES, RAM TYPE

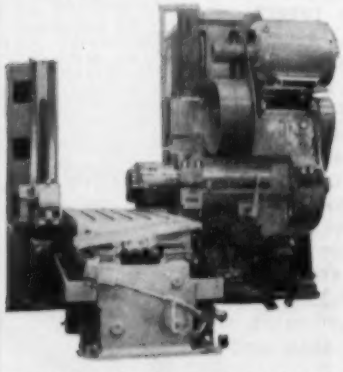
(4) No. 5 Gisholt, Ser. 869-43, Hyd. Speed Selector, Bar Feed, 2½" Cap., Chucking, Threading Att., Collets, Misc. Tooling, T.B., Comp. Elec., 1942
No. 5 Jones & Lamson, Ser. 63573, T.B., Chucker, Rapid, Trav. to Cross Slide, Misc. Tooling, Comp. Elecs., 1944
No. 5 Warner & Swasey, Hyd. Pre-Select Hd., Bar Feed, Chucking, Misc. Tooling, Comp. Elec., 1943

TURRET LATHES, SADDLE TYPE

1A Warner & Swasey, Ser. 564090, T.B., Chucker, Misc. Tooling, Comp. Elecs., 1941
(2) 1A Warner & Swasey, Ser. 274390, Chucker, Comp. Elecs., 1927
2A Warner & Swasey, Ser. 841114, Chucker, T.B., Misc. Tooling, Comp. Elecs., 1945
2A Warner & Swasey, Ser. 639134, 24" Bed Extension, Bar Feed, Chucking, Threading, Well Tooled, T.B., Comp. Elecs., 1942
2A Warner & Swasey, Ser. 306966, T.B., Chucker, Comp. Elecs., 1943
1L Gisholt, Ser. 601-36, T.B., Chucker, Cross Sliding Turret, Misc. Tooling, Comp. Elecs., 1942
1L Gisholt, Ser. 638-34, Bar Feed, Chucking, Misc. Tooling, T.B., Comp. Elecs., 1942

28" x 23' Betts-Bridgeford Engine Lathe
Serial No. E-5128-E

Swing over ways 32"
Swing over carriage 31¼"
Dist. between centers 23'6"
Range spindle speeds 7 to 106 RPM
Hole thru spindle 2⅛"
Equipped with:
2 Carriages
Full length taper attachment to both carriages
Rapid traverse to both carriages
30" four jaw ind. chuck
2 Steady rests



30" x 60" x 30" Ingersoll Openside Planer Type Mill, Serial No. 15884

Table size 30" x 60"
Travel of table 60"
Dist. top of table to center of spindle, max. 57", min. 7"
Vert. travel of spindle head 30"
Dia. of spindle nose 10¾"
Equipped with complete elecs., Power rapid traverse

36"x10' Bridgeford, Geared Hd., T.A., Comp. Elec., 1921
36"x10' Lodge & Shipley, 1922
36"x10' LeBlond, G.H., 1922

AUTOMATIC SCREW MACHINES

No. 2G Brown & Sharpe, Ser. 8829, 1¼" Cap. Vert. Slide, Comp. Elecs., 1940
2" Cleveland Single Spdl., Ser. 23634, 1928
5⅛" Cleveland, Sing. Spdl. Model A, Ser. 40730-843, Vert. Slide, Comp. Elecs., 1943
5⅛" Cleveland, Sing. Spdl. Model A, Ser. 39480, Vert. Slide, Comp. Elecs., 1942
8" Cleveland Model A, Ser. 41990, Vert. Slide, Lots of Tooling, Comp. Elecs., 1943
8" Cleveland Model A, Ser. 40382, Vert. Slide, Lots of Tooling, Comp. Elecs., 1943

PRODUCTION & AUTOMATIC LATHES

No. 10 Sundstrand Auto., Ser. 10-526, T.B., Front & Rear Slides, Air Operated Tailstock, Comp. Elec., 1941
8"x160" Le Swing, Ser. LB-4805, T.B., Front & Rear Slides, Tailstock, Comp. Elec., 1947
16"x16" Porter Cable Speed Lathe, Ser. H1047-B, 1957
12" Fay Auto., T.B., Front & Rear Slides, Comp. Elec., 1942
12" Gisholt Auto., Ser. 3016-7, T.B., Front & Rear Slides, Hyd. Tailstock, Comp. Elec., 1941
12" Blount Speed, 1940

(2) 1L Gisholt, Ser. 603-13, Chucking, T.B., Comp. Elec., 1942
22B Bardons & Oliver, Ser. 17913, Hyd. Pre-Select Hd., B.F., Collets, Chucking, Misc. Tooling, Comp. Elecs., T.B., 1947
No. 2B Foster, T.B., Chucking, Misc. Tooling, Comp. Elecs., 1936
No. 1L Gisholt, Ser. 601-32, Chucker, T.B., Misc. Tooling, Comp. Elecs., 1942
No. 2M-B Libby Univ., Ser. 8006, 9½" Hole, Comp. on Cross Slide, Chucker, Comp. Elecs., 1933

VERTICAL MILLS

No. 3 Cinn. Vert., No. 50 Nat'l. Std. Taper, H.S.D.T. Spindle, 10 to 1200 RPM, Comp. Elecs. Power Feed to head, T.B., Rap. Tra., 1943
No. 3H K&T Vert., No. 50 Nat'l. Std. Taper, Speeds 20 to 1000 RPM, T.B., Compl. Elecs., Rap. Tra., 1941
No. 4 Cinn. Vert., Medium Speed Dial Type, Speeds 18 to 450 RPM, T.B. Power Feed to Head, Comp. Elecs., Rap. Tra., 1942
(3) No. 4 Cinn. Vert., Ser. 8A4VIK-36, Speeds from 18 to 480 RPM, No. 50 Nat'l. Std. Taper, T.B., Comp. Elecs., Rap. Tra., 1941
No. 2 BU Van Norman Univ., Ser. 5341, Dividing Hd., and Tailstock, T.B., Rap. Tra., Compl. Elecs., 1943
No. 2MH Cinn. Plain Horiz., Ser. 5A2P1D-28, T.B., No. 50 Nat'l. Std. Taper, Complete Elecs., Speeds 12 to 1200 RPM, Rap. Tra., 1937

EMERMAN MACHINERY CORP.

865 WEST 120th STREET — Pullman 5-7626 — CHICAGO 43, ILLINOIS

NEW • USED • *One of the Nation's Leading Dealers* • REBUILT

AARON

MACHINE TOOLS • HYDRAULIC AND METAL WORKING EQUIPMENT

• IN STOCK OVER 2000 MACHINE TOOLS! •

OUR GUARANTEE — EVERY MACHINE SOLD BY US MUST SATISFY YOU—OR IT MAY BE RETURNED WITHIN 30 DAYS.

CHECK THESE VALUES

☐ **LOW COST**
Some prices are as low as 5% of present replacement cost.

☐ **RENTALS**
Rentals with option to purchase.

☐ **TESTING**
All machines are run under power before shipment.

☐ **PHOTOS**
Actual photographs are available of each machine listed.

☐ **AVAILABILITY**
All machines are in our own stock and are available for inspection.

☐ **ENGINEERING**
Qualified Engineering Services available for Special Purpose Machinery.

TERMS ☐
All machines may be had on easy terms.

LATE MODELS ☐
Majority of these machines are late—built after 1940.

SELECTION ☐
Over 2000 machines in stock.

TOP QUALITY ☐
These machines are all top quality, used machines.

SPECIAL PURCHASES ☐
Aaron will buy any new machines you require and rent them to you.

EXTRAS ☐
Extra equipment—not always shown—is usually available when you purchase USED MACHINERY.

• REPRESENTATIVE STOCK •

AUTOMATIC LATHES
AUTOMATIC SCREW MACHINES
BORING MACHINES
BOREMATICS
BORING MILLS, HORIZONTAL
BORING MILLS, VERTICAL
DRILLS, SENSITIVE
DRILLS, HEAVY DUTY
DRILLS, Single & Multiple Spindles
BROACHES—HOR. & VERT.
ENGRAVERS, Pantograph
DUPLICATORS & VERT. MILLS
GEAR BURNISHERS—SHAPERS
GEAR CHECKERS—TESTERS
GEAR HOBBERS & SHARPENERS
GEAR GRINDERS
GEAR GENERATORS
GRINDERS, DISC, INTERNAL
GRINDERS, CYLINDRICAL
GRINDERS, CENTERLESS
GRINDERS, SURFACE, TOOL
GRINDERS, THREAD CUTTER
GRINDERS, UNIVERSAL
LATHES, ENGINE, TURRET
LATHES, BENCH, PRECISION
LATHES, AUTOMATIC
MILLERS, PLAIN, DUPLEX
MILLERS, PRODUCTION
MILLERS, VERT. & UNIVERSAL
MOLDING MACHINES
PRESSES—HYD. TO 2500 TON
PRESSES, STRAIGHTENING
PRESSES, O.B.I., 85 TON TO 2 TON
PRESS, S.S. TO 500 TON
ROLLS—POWER-BENDING
PLANERS—SHAPERS
TUBE BENDERS—FORMERS
WELDERS, SPOT, SEAM.-ARC

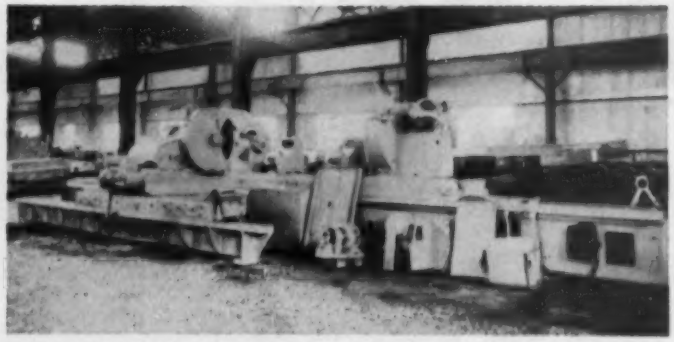
Catalogue Available Upon Request

AARON

45 Crosby St., New York 12, N. Y. WAlker 5-8300

Machinery Company Inc.

ROLLING MILLS—STEEL WORKS EQUIPMENT



1—GRINDER FOR ROLLS, size 34" x 192", Cincinnati, including all electrical controls and the following motors: Main drive 30 HP, head stock 10 HP, carriage 5 HP, cross feed 1 HP, oil pump 2 HP, in good condition, used very little. Uses 36" x 4" wheels.

GEAR REDUCTION SETS

1—6250 HP, 368 TO 84.4 RPM.
1—1800 HP, 570 TO 30 RPM.
1—600 HP, 22.92 TO 1.
1—400 HP, 575 TO 80 RPM.
1—320 HP, 800 TO 107 RPM.

FURNACES

2—ELECTRIC MELTING FURNACES, TOP CHARGE, 11'6" I.D. 2500 KVA.
1—ELECTRIC MELTING FURNACE, SIDE CHARGE, 6 TON, 1667 KVA.
2—BESSEMER CONVERTERS, 10 TON.
2—PACK FURNACES FOR HOT SHEET MILLS, 62" x 60', DOUBLE CHAMBER, CONTINUOUS.
3—13' x 57' SLAB HEATING FURNACES WITH PUSHERS.
1—25' x 100' SLAB HEATING FURNACE.

CRANES

1—200-TON ALLIANCE LADLE CRANE, 55' 5" SPAN, 230 VOLTS D.C., 25 AND 7½ TON AUXILIARIES.
1—60-TON NORTHERN CRANE, 52' 9" SPAN, 10 TON AUXILIARY.
1—10-TON ALLIANCE SOAKING PIT CRANE, 61' SPAN, 31' RAM, 20' 6" Lift.

SHEARS

1—54" x 2½" SLAB SHEAR.
1—3½" x 3½" VERTICAL OPEN SIDE BAR SHEAR.
1—FLYING BAR SHEAR, CAPACITY 1½" ROUND OR SQUARE.
1—PLATE SHEAR, CAPACITY 156" x 9/16".
1—FLYING SHEAR WITH LEVELLER, 22 TO 28 GAUGE, 36" WIDE.
1—SIDE TRIMMER LINE FOR STRIP, 78" x ¼".
1—AUTOMATIC SIDE AND END CUT SHEAR LINE FOR SHEETS.

MISCELLANEOUS

1—BALER FOR SCRAP, BALE SIZE 18" x 10" x 10".
1—BILLETEER, BONNOT-LENTZ, SIZE B, FOR CONDITIONING BILLETS UP TO 12" x 12".
1—CORRUGATING MACHINE, STAMCO #6, WITH 2 SETS OF DIES.
1—DRAWBENCH, 50,000 POUND, BED LENGTH CHAIN END 58', WITH 150 HP VARIABLE SPEED MOTOR.
1—42" ROLL LATHE, ENCLOSED HEADSTOCK, 20 HP ADJUSTABLE SPEED 500/1500 RPM MOTOR.
1—ROLLER LEVELLER, 23 WORK ROLLS 2.165" DIAM. BACKED-UP. CAPACITY 22 TO 13 GAUGE SHEETS 76" WIDTH.

MISCELLANEOUS—Continued

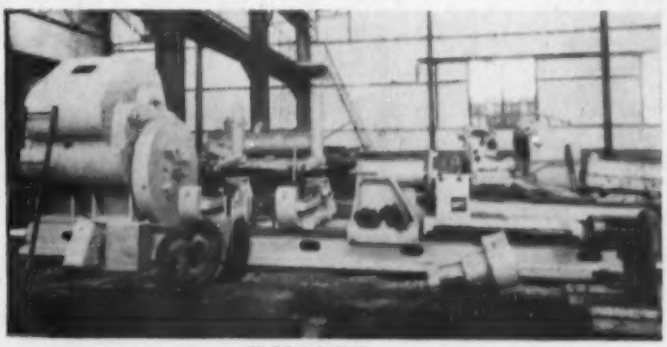
1—ROLLER LEVELLER, WORK ROLLS 2½" DIAM. BACKED-UP. 48" WIDE.
1—PICKLING MACHINE FOR SHEETS, MESTA PLUNGER TYPE.
4—TINNING UNITS FOR HOT DIP TIN PLATE.

ROLLING MILLS

3—4-HIGH HOT STRIP MILL STANDS FOR UP TO 76" WIDTH.
3—4-HIGH HOT STRIP MILL STANDS FOR UP TO 48" WIDTH.
1—34" & 22" x 112" PLATE MILL, 3-HIGH.
1—34" & 22" x 100" PLATE MILL, 3-HIGH.
1—32" x 66" ROUGHING SCALE BREAKER.
1—30" x 42" UNIVERSAL MILL, 3-HIGH.
1—24" 3-STAND BAR MILL WITH TRAVELING TILTING TABLES, GEAR DRIVE, MOTOR, AND ACCESSORY EQUIPMENT.
1—18" BAR MILL, 3-HIGH, SINGLE STAND.
1—10" ROD MILL, 14 PASSES.
1—32" & 18" x 52" SHEET ROUGHING MILL, 3-HIGH, WITH AUTOMATIC TABLES.
4—28" HOT SHEET MILL STANDS, 2-HIGH.
1—4-STAND TANDEM COLD STRIP MILL, 4-HIGH.
2—38" WIDE SINGLE STAND COLD MILLS, 4-HIGH.
2—20" x 48" 2-HIGH COLD MILLS.
1—12" x 16" COLD MILL, 2-HIGH.
1—10" x 16" 3-STAND TANDEM COLD MILL.

MOTORS

1—3500 HP, 240 RPM, 6600/3/60.
1—2000 HP, 600 RPM, 6600/3/60.
2—1500 HP, 443 RPM, 6600/3/60.
1—1500 HP, 234 RPM, 2200/3/60.
1—1200 HP, 300 RPM, 4100/3/60.
1—900/1400 HP, 40/63/190 RPM, 380/600 VOLTS D.C.
1—750 HP, 300/700 RPM, 600 VOLTS D.C.
1—750 HP, 180/450 RPM, 600 VOLTS D.C.



42" ROLL LATHE

All types of rolling mills and steel works equipment, both large and small, are furnished by us. This can mean a single machine or complete equipment for a plant. Our shipments are made under the careful supervision of our engineers. The long period of our operations has been marked by the sustained succession of heavy mill shipments to customers in the United States and abroad. Our business was founded in 1915.

MANY OTHER ITEMS AVAILABLE—SEND FOR OUR LATEST LIST

2220 OLIVER BUILDING **FRANK B. FOSTER, INC.** **PITTSBURGH 22, PA.**

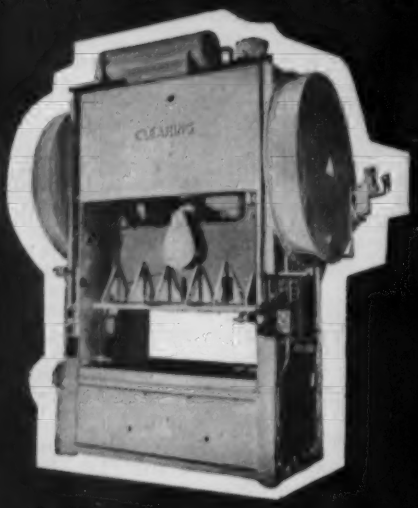
CABLE ADDRESS: "FOSTER PITTSBURGH"

WORLD'S LARGEST STOCK

STAMPING PRESSES

REBUILT GUARANTEED

BLISS
CLEARING
CLEVELAND
FERRACUTE
HAMILTON
L & J
NIAGARA
TOLEDO
V & O



OPEN BACK INCLINABLE
STRAIGHT SIDE
(Single-Double Crank)
HORNING
KNUCKLE JOINT
STILES TYPE
TOGGLE DRAWING
CAM DRAWING
also
SQUARING SHEARS
PRESS BRAKES

JOSEPH HYMAN & SONS

PHILADELPHIA 34, PENNA. TIOGA, LIVINGSTON & ALMOND STS. Phone REGENT 9-7727

IRON & STEEL SCRAP

SECONDHAND RAILROAD CAR REPAIR PARTS

RAILROAD EQUIPMENT

NEW & RELAYING RAILS

NEW & USED STEEL PRODUCTS

THE PURDY COMPANY

RAILWAY EXCHANGE BLDG., ST. LOUIS, MO. HARBOR WAY, SOUTH SAN FRANCISCO, CALIF.
21100 WILMINGTON AVE., LONG BEACH 10, CALIF.
8754 S. DOBSON AVE. Phone BAyport 1-2100 CHICAGO 19, ILL.

Eastern Rebuilt Machine Tools

THE SIGN OF QUALITY—THE MARK OF DEPENDABILITY

RAILROAD MACHINERY

No. 2 Niles-Bement-Pond Axle Lathe, m.d.
No. 3 Niles-Bement-Pond Axle Lathe, m.d.
48" Niles-Bement-Pond Car Wheel Borer, m.d.
90" Niles Balanced Quartering & Crank Pin Turning Machine, latest
90" Putnam Driving Wheel Lathe, m.d.
90" Niles Journal Lathe, including 2 inside journal turrets and 3½" spindle double quartering attachment, m.d.
90" Niles Driving Wheel Lathe, m.d., latest
Niles-Bement-Pond Quartering Machine, m.d., new

PRESSES

100 ton Wood Hydraulic Press, four col., single action
100 ton Chambersburg Hydraulic
300 ton Niles-Bement-Pond Wheel Press, m.d.
600 ton Niles-Bement-Pond Wheel Press, m.d.
Chambersburg 30 ton Hydro-Pneumatic
No. 1 Robinson OBI flywheel vee belt, m.d.
No. 2 Robinson OBI Punch Press, flywheel type
No. 62 B. W. Bliss Duplex Press, m.d.
No. 8-S Cleveland Straight Side Single Crank Press, m.d.

PUNCHES & SHEARS

No. 2 Hilles & Jones Horizontal Punch, m.d.
No. 6 Long & Allstatter Single End, m.d.
No. 7 Thomas Vertical, latest
No. 6½ Hilles & Jones Punch & Shear, single end, type G
Cleveland Shear, 72" gap, 18" blade, 1" plate
72" gap Cleveland Plate Punch
Wiedemann Pneumatic Punch, bench model

PLANERS

P10 Coulter Crank Type Shaper-Planer, 1 head, m.d.
20"x20"x5' Whitcomb-Blaisdell, Planer, 1 head, m.d.
24"x24"x6' G. A. Gray Planer, belted m.d., 1 head on cross rail
30"x30"x8' Cincinnati, belted m.d., 2 rail heads
30"x30"x10' Cincinnati, belted m.d., 2 heads
30"x30"x10' G. A. Gray, m.d., late
36"x36"x8' Cincinnati, m.d., 2 heads on rail
36"x36"x10' Betts, belted m.d., 2 heads on rail, 2 side heads
36"x36"x10' Gray, Extra Heavy Pattern, m.d., 2 heads on rail
36"x36"x10' Niles-Bement-Pond, belted m.d., 1 head on cross rail
36"x36"x12' Betts, m.d., 2 heads
36"x36"x20' Cincinnati, 2 heads, belt
36"x36"x20' G. A. Gray, 2 heads, belt
36" widened to 42"x36"x20' Cincinnati, m.d., 2 rail heads, 1 side head
42"x42"x26' G. A. Gray, 2 heads, belted m.d.
48"x48"x18' Niles-Bement-Pond, 2 heads, belt
48"x48"x18' Detrick & Harvey, 4 heads, reversing m.d.
48"x48"x28' Cincinnati reversing m.d., 4 heads
56"x42"x14' Cincinnati, belted m.d., 2 heads

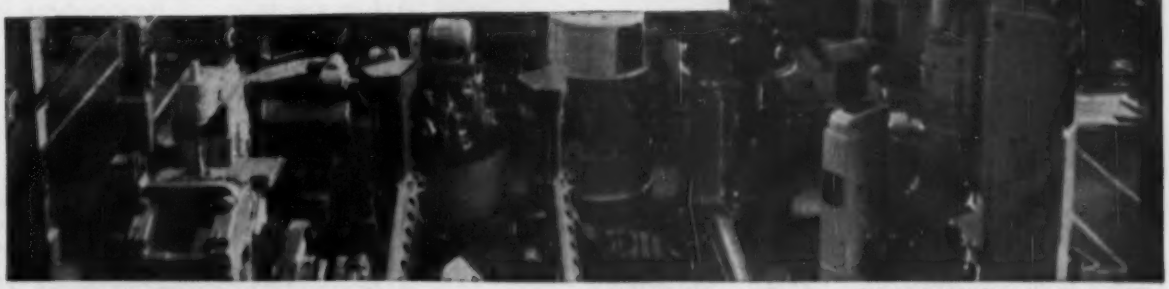
TURRET LATHES AND SCREW MACHINES

No. 60I W. D. Oster Geared Head Rapiduction, m.d. in leg, chucking
No. 1 Warner & Swasey, "Electric", m.d., bar
No. 1A Warner & Swasey, m.d.
No. 1L Gisholt, Universal, m.d.
No. 1, 2 Cincinnati Acme Full Universal, m.d.
No. 2A Warner & Swasey, m.d., bar
No. 2F Foster Fastermatic, m.d., Timken
No. 2G Morey, 1" cap., bar
No. 3 Cincinnati-Acme Full Universal, m.d., chucking
No. 3 Jones & Lamson, 1½" cap., full Universal, m.d.
No. 3 Warner & Swasey, m.d.
No. 3 Foster Geared Head, m.d.
No. 3A Warner & Swasey, m.d.
No. 3F Foster Fastermatic, m.d., Timken
No. 4 Warner & Swasey, cone, bar and chucking types
No. 4A Warner & Swasey, Universal, m.d., chucking
No. 4 Warner & Swasey, preselector head, m.d.
No. 4 Gisholt Universal, m.d.
No. 4L Gisholt Universal, m.d.
No. 4FU Foster Fastermatic, m.d., latest
Model 4H12 Libby, cross sliding turret, m.d.
No. 5 Foster Universal Ram Type, m.d.
No. 5 Gisholt Universal, m.d., late type
No. 5 Warner & Swasey, m.d.
⅝" Pratt & Whitney Hand Screw Machine, cone, bar
2½x24", 3½x32", 4x34" Jones & Lamson Geared Head, m.d., bar and chucking
18" Libby Type A, m.d., chucking
20" Acme, s.p.d., bar
20" Dreses, arranged for factory, m.d.
26" Libby Type C, m.d., chucking

We carry an average stock of 2,000 machines in our 11 acre plant at Cincinnati. Visitors welcome at all times.

THE EASTERN MACHINERY COMPANY
1002 Tennessee Avenue, Cincinnati 29, Ohio
MElrose 1241
CABLE ADDRESS
EMCO

INTERSTATE.... the DEPARTMENT STORE of machinery



SELECTION, SERVICE, PRICE

HUNDREDS OF PRESSES IN STOCK

Presses of all types, sizes and makes. Interstate's sales engineers can "suggest" the best press for your stamping job. Send for our new booklet "How to Choose the Right Press." It's free.

COMPLETE SHOP FACILITIES

This 7" Giddings and Lewis planer type boring mill is one of the largest in any rebuilding shop. This, and our standard tool room equipment enable us to rebuild, or in some cases re-manufacture, equipment of all types and sizes.

All important factors to you, all part of Interstate's way of doing business. Two thousand metal working machines are in stock at all times . . . one of America's most diversified stocks of machinery. Write today for our latest catalog . . . ask about the convenient Rental or Pay-as-it earns plans.

Interstate Machinery Co., Inc.
1421 W. PERSHING RD. • CHICAGO 9, ILL.
PHONE YARDS * 7-5800

UNUSED

A. B. Farquhar Co.

50 ton press—save 50%

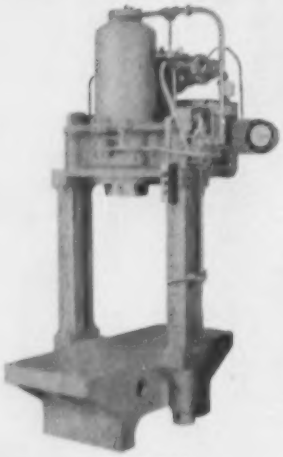


Fig. P-332
50-Ton Utility Press

Capacity	50 tons
Clear Between Housing, L. to R.	26"
Bottom Platen, L. to R.	22"
Bottom Platen, F. to B.	60"
Daylight	36"
Stroke	15"

5 H. P. Pump Unit

C. G. WYATT MACHINERY CO., INC.
24th & Hayes Ave.
Camden 5, New Jersey

TOGGLE PRESS
#165 Toledo, strokes 14"-10", motor drive.

HI-SPEED PRESS
#650 Bliss, Straight Side, 4-post, stroke 2".

DIEING MACHINE
50-ton Henry & Wright, stroke 3½", Reeves vari-drive.

STRAIGHT SIDE TRIMMING PRESS
#54 Bliss Consolidated, stroke 5", geared motor drive.

STRAIGHT SIDE, SINGLE CRANK PRESSES
#40-7 Minster, 220-ton, stroke 11½", equipped with air cushion.
#55-½ Toledo, back geared, stroke 6".
#56-½ Toledo, back geared, stroke 6".
#308 Bliss, double back geared, stroke 14".

PRESS BRAKE
#40-6 Cincinnati, 6 ft. 10 ga. capacity, 8 ft. bed, 65-ton.

Power Press Specialists

471 North 5th St., Philadelphia 23, Pa.

LOOK THESE OVER

100" BETTS Vertical Boring & Turning Mill, two heads on rail, M.D., 1930
No. 1½B x 81" PRATT & WHITNEY Duplex Deep Hole Drilling Machine, M.D., 1942
No. 429 BARNES Two-Spindle Deep Hole Drilling Machine, M.D., 1942
No. ½B x 50 PRATT & WHITNEY Two-Spindle Reaming Machine, M.D., 1944
3' arm 11" column CARLTON Radial Drill, motor-on-arm drive, 1942
Model GCP-24 RED RING Heavy Duty Ultra-Precision Gear Shaver, 1952, machine like new
10" x 72" LANDIS Type "C" Plain Hydraulic Cylindrical Grinder, 1942
12" x 30" centers MONARCH Model C Toolroom Lathe, M.D., 1942
22" x 48" centers MONARCH Model CM Heavy Duty Geared Head Lathe, M.D., 1943
22" x 336" centers MONARCH Model CM Heavy Duty Geared Head Lathe, M.D., equipped with two carriages, each with taper attachment for long taper turning, actual swing over bedways 27½", 1940
24" x 144" centers BOYE & EMMES Geared Head Engine Lathe, T.A., M.D., 1941
30" x 17' centers AMERICAN "Super Productive" Geared Head Lathe, M.D., 1941
60" x 18' bed (81" centers) LeBLOND Heavy Duty Geared Head Lathe, new 1952—never used.
No. 2 CINCINNATI High Speed Dial Type Plain Millers (2), 1942
24" x 60" FITCHBURG Heavy Duty Bed Type Milling Machine, table 24" x 72", 1953, M.D.
Nos. 3 & 4 WARNER & SWASEY Ram Type Universal Turret Lathe, bar feed, M.D., 1941
Nos. 7A & 8A JONES & LAMSON Saddle Type Universal Turret Lathe, M.D., 1940

Wigglesworth Industrial Corp.
62 Border St., East Boston 28, Mass.

MELTING FURNACES

500#/hr. MOORE with 400 KVA, 4160 V. Trans.
1 ton/hr. MOORE with 800 KVA, 11,000 V. Trans.
1½ ton/hr. MOORE with 1000 KVA, 23,000 V. Trans.
2½ ton SWINDELL, Top Charge, 1500 KVA, 23,000 V. Trans., Amplidyne Controls
20 KW AJAX, 17#, High frequency Spark Gap
60 KW AJAX, 60 cycle, tilt type for Alum.

BALING & BRIQUETTING PRESS
¾ ton/hr. MILWAUKEE Hydraulic Briquetting Press—excellent
LOGEMAN Bailer for brass, blocks 13" x 5" x 5"

UNIVERSAL

MACHINERY AND EQUIPMENT CO.
320 E. BROAD ST.
SHILLINGTON, READING, PENNSYLVANIA
PHONE: READING 7-1321

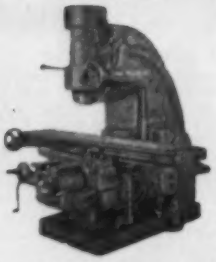
Chucker 6" National—Acme RP. L-8. (3)
Column Facer, Espen-Lucas 20"
Grinder, Surface 6"x18" Thompson Hyd. Ct. Motor 3/60/220-440 V.
Hack Saw 9A, Marvel, auto. bar feed.
Lathe, 24"x15' c. Amer. 12-speed GH., TA.
Miller 5-48 Cin. Hydro. R. & F. Index.
Pipe Machines Landis 2", 6" & 12"
Pipe Machines Oster 6", #326—'40.
Shell Lathes #31 Morey, late, unused.
Straightener & Cut-Off Machine, ⅜" Shuster, M.D. 3/60/220.
Threader 2" Landmaco S.H., Internal trip.

GALBREATH MACHINERY COMPANY
221 Corliss St. Pittsburgh 20, Pa.

Natco Nos. G5 & C12 Multi-Drills.
Gleason 3" Str. Bevel Gen., Ser. 15504.
Hardinge Mod. H.C.T. Chuckers.
P. & W. 30" Vert. Profiler.

D. E. DONY MACHINERY CO.
4357 St. Paul Blvd. Rochester 17, N. Y.

PRACTICALLY NEW



2 — No. 4CH KEARNEY & TRECKER Vertical Milling Machines, 15 HP main drive motor, 3 HP feed & rapid traverse motor, ¼ HP coolant motor; 24 speeds 15 to 1500; table 74" x 15½"; monolever control; back lash eliminator; coolant system; micrometer stop and dial indicator.

O'CONNELL MACHINERY CO.
Tel: BAiley 5800
1693 GENESEE ST. BUFFALO 11, N.Y.

#61A Fellows Gear Shaper—Serial #21252.
Late type 12" x 48" Landis Type C Universal Hydraulic Cylindrical Grinder Serial #17886.
72" Niles Bement Pond Vertical Boring and Turning Mill—Reconditioned.
Reconditioned 20" x 10' Bed Ledge & Shipley Model "E" Selective Head Engine Lathe—Serial #29286.
#72A3—Heald Sizematic Internal Grinder — Serial #12276—Reconditioned and guaranteed.
#4 Warner & Swasey Turret Lathe Serial #642013.
7A Jones & Lamson Turret Lathe Serial #80450.
(2) Greenfield #20 Hydraulic Internal Grinder — Serials #1-11-11902 and #4-11235.
#5 Cincinnati Plain Horizontal Higher Powered Miller.
#47 Heald Single End Borematic—Serial #4646.
DB2112-A Exzello Single End Borematic — Serial #10100.
42" Bullard Vertical Turret Lathe, Serial #14091.
2-3-4 Spindle Leland Gifford Drills.
1—⅝" Cenematic & Tooling.
8" Bar Floor Type Niles Horizontal Boring Mill with Floor Plate. Serial #17755.
#2B Brown & Sharpe Standard Plain Horizontal Milling Machine—Serial #4107.
26" Bullard Vertical Boring Mill — Spiral Drive. Serial #15090.
8 x 8" x 1½" Kling Angle Shear Serial #1277.

HAZARD BROWNELL MACHINE TOOLS, INC.
350 Waterman St. Providence 6, R. I.

IMMEDIATE DELIVERY

FERRACUTE SD-703 Double Action Toggle Draw Press 700 Ton Cap., Bed Area 60" F.B. x 72" L.R., Stroke of Plunger 48", Stroke of Blankholder 20", 100 H.P. Motor.
BLISS No. 88 Straight Side Single Crank Press, Capacity 255 tons, Bed Area 30" & 29", 18" Stroke of Slide, Marquette Air Cushion.
TOLEDO Double Cranks, Nos. 91-42, 92C, 93½E.
CLEVELAND Double Cranks, 65-G-72, 45-D-60.
NIAGARA Double Cranks, 67C, 69BX, 612C.
BLISS Nos. 4, 22K, and 24K Knuckle Joint Presses.

"If it's machinery we have it."

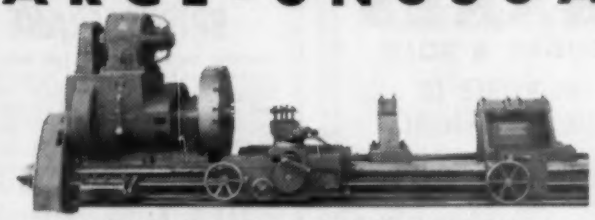
NATIONAL MACHINERY EXCHANGE
128 Mott St. New York 13, N. Y.
CAnal 6-2470

BENNETT MACHINERY CO.

Late Type 50" x 30' bed Niles Lathe
86" x 68' can. Niles Lathe
36" Rockford Hydraulic Slotter
24", 42" x 54" Bullard Mills
(Send for list of 280 stock tools)

305 Allwood Rd., Clifton, New Jersey

LARGE-UNUSUAL



48" x 85' Niles Bement Pond Engine Lathe and Gun Boring or Trepanning Mach., Dbl. head, 2 carriages w/P.R.T., 2 tail stocks, MD

BORING MILLS, HORIZONTAL
No. 31 Lucas, 3" Bar, Motor Drive
No. 399 Giddings & Lewis, 4" Bar, Floor Type, MD w/Univ. Rotary & Tilting Table
4" Bar Sellers Floor Type, Series 400, Range 96" Vert., 12' Horiz.
5" Sellers Drilling & Boring, Floor Type (2)

BORING MILLS, VERTICAL
24" Bullard New Era
54" Bullard Maximill
27" Betts, Rail and Housings only
36" Niles, 36' Diameter Table, 2 Swiv. Heads, MD.

BRAKES
25' x 1" 750 Ton Hyd. Press Brake, exceptionally fine cond.

DRILLS
5' Carlton Radial Drill, Motor on arm

LATHES, ENGINE
48" x 29' Niles Bement Pond Standard, MD, P.R. Traverse to Carriage
48" x 56' Niles Bement Pond Standard, MD, P.R. Traverse to Carriage
24" x 90" C-C Boye & Emmes Grd. Hd.-T.A., MD
13" x 18' C-C Auto. Threading Lathe

LATHES, TURRET
1A Warner & Swasey—Chucking

PLATE EDGING MACHINES
36' x 4½" Hilles & Jones Plate Edge Milling Machine
32' x 2" Sellers Model C—Edging & Scarfing Heads, Rev. MD
32' x 1" Sellers Model B—Plate Planer, Rev. MD

PLANERS
48" x 48" x 16' Niles, 2 hds, Box Table, Reversing MD
48" x 48" x 34' Niles, 4 hds, Box Table, Reversing MD
60" x 60" x 14' Niles, 4 hds, Box Table, Reversing MD
96" x 120" x 20' Betts, 4 hds, w/Aux. Milling Heads, P.R.T., Rev. MD

PLANERS, OPENSIDE
60" x 60" x 18' Bethlehem (D&H) Box Table, P.R.T., Forced Feed Lub., Rev. MD

ROLLS, BENDING
32' x 1" Bement-Miles, Ship Plate Type, MD

ROTATORS
30 Ton Brownhoist Billet Rotator w/Shock Absorber, Hook Susp.

SHAPERS
36" American Universal Back Geared Shaper, V-Ram, MD

MACHINE TOOL SALES COMPANY

36 S. Delaware Avenue — Philadelphia 6, Pa.
Telephone WA 2-1120

2—#55 Buffalo Mill Type Open Throat Bar Shears, 6" Stroke, Capacity 275 Ton.
D & K Press Brake, Capacity 7/16" x 8', 8'6" between housing, 8'6" ram.
Hilles and Jones and Buffalo Bar Shears, 1½", 2", 2½", 3", 3¼", 4" and 4¼".
2-A Williams White hydraulic tube bender, capacity 2".
Long & Allstatter Horizontal Beam Bender, 24" beams.
Angle Shear, Double, 8" x 8" x 1".
Kling No. 6 Bar & Billet Shear, 6" round.
10 Furnaces, Heat Treating—Lindberg, Leeds Northrup, American Gas, Westinghouse.
4000 Lb. Niles Bement Double Frame Steam Forging Hammer.
Chambersburg Board Drop Hammers, 900 Lb., 1000 Lb.
Nazel Air Forging Hammers, #4-B, #5-N.
Williams White Bulldozers, #22, #3, #4, #25, #6, #29 U type.
Ajax Forging Rolls, from #1 to #4.
Ajax & National Upsetters, Suspended Slides, 1", 1½", 2", 3", 4".
Upsetting and Forging Machines. Not Suspended Slides, ¾", 1", 1½", 2", 2½", 3".
300-Ton Oilgear High Speed Hydraulic Press, 2-Column, ram 27" x 23".
600-Ton Verson Knuckle Joint Coining Press.
Landis Landmeco Threading Machines, With Lead Screws, 4-Spindle 1½", 2-Spindle ⅞", 2-Spindle 1", 2-Spindle 1½"; Without Lead Screws, 2-Spindle 1½".
Multiple Punch, Size G, L & A, 940 Ton.
Single and Double End Punches, various capacities and throat depths.

BOLT, NUT AND RIVET MACHINERY, COLD HEADERS, THREAD ROLLERS, THREADING MACHINES, TAPPERS, COLD BOLT TRIMMERS, SLOTTERS, HOT HEADERS AND TRIMMERS, COLD AND HOT PUNCH NUT MACHINES.

DONAHUE STEEL PRODUCTS CO.

1913 W. 74th Street, Chicago 36, Ill.

MACHINE TOOLS

NEW — USED — REBUILT

OVER 1000 MACHINE TOOLS 'IN STOCK'

25" x 10' Axelson Lathe, Heavy Duty, Late Type
27" x 18' Monarch "10" Lathe, 11" centers, Taper Attachment; Full equipment, late type
No. 2, 4, 5, 1A Warner & Swasey Turret Lathes, Late Type
No. 7 Gardner & Oliver Universal Turret Lathe, 2½" cap. Preselector Head, Late Type
24", 30", 42" Bullard Vertical Turret Lathes, Turret Head, Side Head, Motor Driven
4' arm, 15" col. Carlton Radial Drill, 40 spindle speeds, 15-1500 RPM; Late Type
5' arm, 13" col. Foodick Economax Hydraulic Radial Drill, Late Type
6' arm 17" col. Foodick Economax Hydraulic Radial Drill, Late Type
6' arm 19" col. Carlton Radial Drill, 48 spindle speeds, 20 HP., Late Type
No. 2-18 Cincinnati Plain Automatic Mill, late type
No. 2 Brown & Sharpe Vertical Mill, light type, swivel head, late type
10' x 10 ga., 10' x ¼" Wysong & Miles Power Squaring Shears, Motor Drive
T-56 Verson Power Press Brake, 9' overall, late type, 190 tons cap.

SEND US YOUR INQUIRIES

FALK MACHINERY COMPANY

16 WARD ST. — BAKER 5887 — ROCHESTER, N. Y.

SELECT MACHINE TOOLS

BORING MACHINES
3½" No. 22 Lucas horiz. table type.
36" & 42" Bullard vertical turret lathes.
72" Niles Bement Pond vertical mill.

DRILLING MACHINES
4' arm 15" col. Carlton radial, P.F., P.E.
9' arm 16" col. American radial, H.D.

GRINDING MACHINES
8" x 15" No. 5 Brown & Sharpe Hyd. Surf., 1941
40" No. 16A2 Blanchard 2-spd. rotary, new 1945.
72" Hanchett 3-spd. rotary surface, new 1946.
18" x 96" Landis gap type cylindrical, new 1951.

LATHES
No. 5 Jones & Lamson ram type univ. turret (2) late.
26" x 20' bed LeBlond H.D., G.H., older.
48"/52" x 30' bed NBP geared head, like new.
54" x 40' bed Pond, older but exc.

MILLS
1-12, 1-18 & 2-18 Cincinnati production
4-36 & 4-48 Cincinnati hydromatic production.
1-2-3-4-5-6 knee type plain & vertical.
24" x 24" x 12' Ingersoll adj. rail planer type. 1945.
42" x 42" x 19' Ingersoll adj. planer type.
60" x 48" x 16' Ingersoll adj. rail planer type.

PRESSES
12'x ½" Dreis & Krump bending brake.
105 ton No. 7½ Verson OBI (2) 1950.
100 ton No. 95C Toledo S.S., D.C., cushions.
150 ton 7846 Verson Gap Frame.
150 ton No. 13-1 Cleveland OBI, late type.
250 ton No. 23 Bliss K-J coining or embossing
300 ton No. 1039 Hamilton D.C. adj. bed 60" x 102".
400 ton No. 663 Toledo K-J coining or embossing.
500 ton Baldwin Southwark HYSPEED Hyd., '38.
1000 ton No. 606 Toledo coining or forging.

SHAPERS
24" G & E Industrial universal, cer. 1024AS.
32" G & E Invincible, F.M.D., late type.

UPSETTERS
3½" Ajax, suspended slides, steel frame.
5" Ajax suspended slides, steel frame.
1½" Natl. susp. slides, auto-lub. guided ram.

1000 Tools in Stock

Free Illustrated Catalog

MILES MACHINERY CO.

Phone Saginaw 2-3105
2041 E. Genesee Ave. — Saginaw, Mich.

OFFERING

BRIDGE CRANES

ARNOLD HUGHES COMPANY
765 Penobscot Bldg. — Detroit, Mich.
WOodward 1-1894

DIESEL LOCOMOTIVES & CRANES

30 TON OHIO LOCO. CRANE, NEW 1947.
25 TON AMER. LOCO. CRANE, NEW 1941.
4—125 TON G.E. DIESEL ELEC. LOCOMOTIVES.
1—44 TON G.E. DIESEL ELEC. LOCOMOTIVES.
1—65 TON WHITCOMB DIESEL ELEC. LOCOMOTIVE.

3—42 X 36 METAL TURNINGS CRUSHERS
3 JEFFREY MT-26 WITH 125 H.P. MOTORS.

60—10,000 GAL. STEEL TANKS
60 R.R. TANK CAR TANKS WITH COILS IN N.J.—LA.—ILL.—KANS. & ARK.

DARIEN, 60 E. 42nd St., N. Y. 17, N. Y.

KNOX
REBUILT
AIR COMPRESSORS
FULLY GUARANTEED
EARL E. KNOX COMPANY
1111 BACON STREET — EARL, PA.

Try the **WANTED SECTION**
for
"Hard-to-Find" Materials or Equipment

AIR TOOLS

Large savings on new and rebuilt Government surplus. Rivet Hammers, Chippers, Busters, Impact Wrenches, Drills, Grinders, Rivet Squeezers—up to 150 ton capacity. Send for our lists of guaranteed tools. We buy your surplus equipment.

MONTGOMERY ENGINEERING CO.
1798 W. Philadelphia, Detroit 6, Mich.
Phone: TR 4-9029

ROLL GRINDERS

2—36" x 240" CINCINNATI
Traveling Wheelhead
Filmatic Bearing—Hydraulic Feed
Crowning Attachment—Motors—Controls

IN STOCK—REBUILT

LANG MACHINERY COMPANY
28th St. & A.V.R.R. Pittsburgh 22, Pa.

CRANES

BOUGHT & SOLD
ENGINEERED TO YOUR REQUIREMENTS

Ornitz Equipment Corp.
Industrial Engineering Service
320 3rd Ave. Brooklyn 17, N. Y.
TRiangle 5-2553

30 Ton — 65 Foot Span

BRIDGE CRANE

Northern Engineering Co. Fish belly fabricated—travel motor—trolley motor—30 ton hoist—15 ton auxiliary hoist motor. All 230 volt DC motors—mfd. by G.E.—cab controlled with G. E. controls. Can be seen in operation. Immediate delivery.

THE BOSTON METALS CO.
313 E. Baltimore Street
Curtis 7-5050 - Baltimore 2, Md.

FOR SALE

65 ton Porter Diesel-Elec Locomotives 400 HP Cummins Engines. Reconditioned & Guaranteed.
10—30 cu yd Koppel & Western Steel Air Dump Cars. Bargain.
30 ton Industrial Brownhoist Gas Locomotive Crane 70 ft bm. Overhauled. Cheap.
25 ton Orton Diesel Locomotive Crane. Cat D13000 Eng New 1943. Reconditioned.

Mississippi Valley Equipment Co.
501 Locust St. St. Louis 1, Mo.

LOCOMOTIVES: 2-65 ton diesel electric, standard gauge, 0-4-4-0, in guaranteed condition. For sale or rent.
2—75 ton and 85 ton, electric, standard gauge, 600 volt, D.C.
LOCOMOTIVE CRANE: Link Belt 25 ton, standard railroad gauge, gasoline powered, air brakes, cast steel trucks, bucket handling, with or without 1¼ yd. clam shell bucket. For sale or rent. Located Minnesota.
BLOWER: Roots-Connersville, 39,500 CFM, 63" of water, with 500 H.P., 2300 volt, A.C. motor. NEW, UNUSED.
OVERHEAD ELECTRIC CRANE: 8 ton, 54' span, 4 motor, clam shell bucket operating, 440 volt, 3 phase, 60 cycle.

A. J. O'NEILL
Lansdowne, Pa.
Phila. Phones: MAdison 3-8300 - 3-8301

Keep 'em rolling . . . not rusting

FOR SALE

New—Used—Reconditioned railroad freight cars • car parts • locomotives • tank cars • steel storage tanks.

MARSHALL RAILWAY EQUIPMENT
Corporation
50 Church St., New York 7, N. Y. COrtlandt 7-8090
Cable MARAILQUIP

OVERHEAD CRANES

5-ton NEW P&H 48'6" span, 3-motor, 230 VDC cab.
2—7½-ton Shaw, 67'1" and 66'8" span, 3-motor 230 VDC cab.
2—10-ton Shaw, 67'1" span, 3-motor, 230 VDC cab.
1—20-ton Morgan, 4-motor, 5-ton, aux., 68'7" span, 230 VDC.
1—35-ton Northern, 5-ton aux. 75'0" span, 220/-3/60 cy. cab.
1—75-ton Morgan Ladle Crane, 25 ton aux. 4 girder 49'6" span, 230 VDC cab.
100 other cranes—various tonnages, spans and current.

SEND ME YOUR CRANE INQUIRIES

JAMES P. ARMEL—Crane Specialist
710 House Bldg. Pittsburgh 22, Pa.
Telephones: Gr. 1-4449

USED MILD PLATES

Excellent condition. Various sizes from 3/16" to 1.00"

FREIGHT CARS
CAR PARTS, RAILS

Consolidated Ry. Equipment Co.
105 S. La Salle St., Chicago 3, Ill.

New **RAILS** *Relaying*

We carry frogs, switches, spikes and bolts in stock and most all sections of rails and track accessories.

M. K. FRANK
480 Lexington Ave., New York, N. Y.
Park Building, Pittsburgh, Pa.
105 Lake St., Reno, Nevada

PRIME ALUMINUM COIL

Below Mill

3s ½ HD.
30,000# (020-24 GA.) 3½"
75,000# (020-24 GA.) 9½"
25,000# (020-24 GA.) 4"
2,000# (020-24 GA.) 4½"

PEERLESS STEEL SPECIALTIES CO.
1540 So. Michigan Ave. Chicago 5, Ill.
Phone WAbash 2-0080

FOR SALE

6 new P & H Zip-Lift electric hoists, 3 phase, 60 cycle, 440 volt, ½ hp. motors, capacity 1000 lbs., 13 F.P.M. hoisting speed. 6 new 4 button pushbutton stations, and 1 wall mounted 2 button station for operating same. Equipment in original cases.

NEW YORK RUBBER CORP.
Beacon, N. Y.

MACHINES FOR YOUR YARD

Northwest 15 ton truck crane
Lorain 5 ton crawler crane
Butler fork lift truck
40' bucket elevator
Eagle coal crusher
7½ KW generator for magnet crane

TRACTOR & EQUIPMENT CO.
10006 Southwest Highway, Oak Lawn, Ill.

SPEED REDUCERS FOR SALE

SACO #12 with 10:1 reduction ratio—2 available—new condition.

THE BOSTON METALS CO.
313 E. Baltimore Street
Baltimore 2, Md. - Curtis 7-5050

LIFTING MAGNETS

A complete magnet service. Magnets, new & rebuilt, generators, controllers, reels, etc.

Magnet specialists since 1910

Goodman Electric Machinery Co.
1060 Broad St. Newark 2, N. J.

24 GAGE PICKLED DRY PRIME SHEETS

30x120 quantity 2730# 28x 72 quantity 13670#
28x120 quantity 7710# 28x 60 quantity 9970#
28x 84 quantity 23000# 24x 70 quantity 7280#

Prices Reasonable

LAFFREY STEEL CO.
4233 Delemere Royal Oak, Mich.
Phone: Jordan 4-6474

New **RAILS** *Relaying*

Railway Track Accessories

STANDARD IRON & STEEL CO.
Office & Yards: Knoxville, Tennessee

These are the rates that apply for space in the

Clearing House Section
Equipment and Materials Wanted Section
Contract Manufacturing Section
Business Opportunities Section

	1 Time	3 Times	6 Times	12 Times	24 Times	52 Times
1 inch	$ 12.25	$ 11.55	$ 10.95	$ 10.30	$ 9.60	$ 9.00
2 inches	23.75	21.90	20.40	19.20	18.00	17.20
3 inches	34.55	32.85	30.60	27.00	27.00	26.00
4 inches	46.10	40.80	38.40	36.00	34.55	32.65
5 inches	57.60	51.00	45.00	45.00	43.20	40.80
6 inches	65.50	61.20	54.00	54.00	51.85	48.95
8 inches	87.35	76.80	72.00	69.15	65.30	60.85
10 inches	110.00	98.00	90.00	86.35	82.00	76.00
15 inches	153.00	135.00	129.50	122.50	114.00	108.00
30 inches (Full Page)	270.00	259.00	245.00	228.00	216.00	204.00

RE-NU-BILT
GUARANTEED
ELECTRIC POWER EQUIPMENT

D. C. MOTORS

Qu.	H.P.	Make	Type	Volts	RPM
1	2200	G.E.	MCF	600	400/500
1	2000	Whse.	MIII	600	230/460
1	1200	G.E.	MCF	600	750/850
1	940	Whse.	QM	250	140/170
1	940	Whse.		250	450/550
1	835	Whse.		250	85/100
1	600	Al. Ch.		250	400/800
1	565	Whse.	CC-216	600	300/900
1	500	G.E.	MCF	600	300/900
2	450	Whse.		550	415
1	400	G.E.	MCF	550	300/1050
1	200/300	G.E.	MPC	230	360/920
1	250	G.E.	MPC	230	400/600
1	200	Rel.	1970T	230	720
1	200	Whse.	CB-5113	250	600/900
1	150	G.E.		600	250/750
1	150	Cr. Wh.	60H	230	1150
8	150	Cr. Wh.	60H-TEFC	230	890
1	150	Whse.	SK-151B	230	950/1800
1	100	Whse.	SK-201	230	360/950
1	80/120	G.E.	MCF	230	250/1000
3	100	Whse.	SK-181	230	450/1000
1	100	G.E.	CDP-115	230	1750

M-G Sets—3 Ph. 60 Cy.

Qu.	K.W.	Make	RPM	D.C. Volts	A.C. Volts
2	2000/2400	G.E.	450	250/300	2300/4600
3	1750/2100	G.E.	514	250/300	2300/4600
1	2000	G.E.	300	35cy 600	11000
3	2000	G.E.	514	600	6600/13200
3	2000	G.E.	450	600	2300/4600
1	1500	G.E.	720	600	6600/13200
1	1500	C.W.	514	90/115	4000/13000
1	1000	G.E.	900	300	6600
8	1000	G.E.	720	600	2300/4600
2	750	G.E.	720	275	2200/4400
1	750	C.W.	514	90/115	2300
1	600	G.E.	720	250	440/2300

TRANSFORMERS

Qu.	KVA	Make	Type	Ph.	Voltages
1	5000	Whse.	OISC	3	2300x26400
1	2500	Whse.	OISC	3	26400/13200x460
3	2000	G.E.	HVDDJ	1	66000x13800
3	1000	G.E.	HVDDJ	1	2400x480
8	1000	Wagner	OISC	1	12300x460
8	667	G.E.	HD	1	12300x2300

BELYEA COMPANY, INC.
47 Howell Street, Jersey City 6, N. J.

REBUILT—GUARANTEED ELECTRICAL EQUIPMENT

SLIP RING MOTORS
Constant Duty—3 phase 60 cycle

Qu.	HP	Make	Type	Volts	RPM
1	1500	G.E.	MT-404	2300	257
1	1200	G.E.	MT-34	4160/2300	300
1	1200	G.E.	MT-36	2300	277
1	700	G.E.	I-M	2300	400
1	500	AL.-Ch.	ANT	2300	514
2	500	G.E.	I-16-M	2200	450
2	400	G.E.	MT-413	2300	400
1	300	G.E.	I-17A-M	2300	600
1	250	Whse.	CW-307	440	1200
1	250	Al.-Ch.	ANT	440	720
1	250	G.E.	MT-414	2200	300
1	200	G.E.	I-17A-M	2200	450
1	150	Al.-Ch.	ANT	440	720
1	125	G.E.	MT-557	2300	1200
2	100	G.E.	I-15A-M	2300	495

SQUIRREL CAGE MOTORS
3 phase 60 cycle

Qu.	HP	Make	Type	Volts	RPM
1	400	G.E.	I-K	2200	514
1	300	Whse.	CR-880	2300	1750
1	200	Whse.	CR-873-C	2300	1160
1	200	Al.-Ch.	AR	440	590
2	125	Al.-Ch.	AR	2300	1750
1	125	Al.-Ch.	AR	2300	490
1	100	Whse.	CR-663	440	1750
1	100	G.E.	KT-562	440	570
1	100	Whse.	CR-938	2200	495
1	75	Al.-Ch.	AR	2200	690

SYNCHRONOUS MOTORS
3 phase 60 cycle

Qu.	HP	Make	PF	Volts	RPM
1	2000	Whse.	80	4800/2400	720
2	2100	G.E.	100	2300	360
2	2000	G.E.	80	2300	720
3	1750	G.E.	100	2300	3600
1	750	G.E.	80	2300	450
1	710	G.E.	80	2300/440	720
1	500	El. Mchy.	80	440	1200
1	350	G.E.	80	440/230	900
1	250	G.E.	100	2300	514
1	250	Whse.	80	440	600
2	200	Whse.	80	440	1200
1	187	G.E.	80	440	720
1	150	G.E.	100	2300	900
1	150	G.E.	100	550	600
3	125	G.E.	80	4000/2300	1200
2	125	El. Mchy.	100	4800/2400	900
3	100	Whse.	80	440	1800
2	100	G.E.	80	440	600

T. B. MAC CABE COMPANY
4302 Clarissa St., Philadelphia 40, Penna.

Cable Address	Phone
"Macsteel" Philadelphia, Pa.	Davenport 4-8300

46th YEAR —:— 46th YEAR

MOTORS & GENERATORS, etc.
1 YEAR GUARANTEE
Partial Listing Only!

250 VDC MG SETS

KW	Make	Type	Speed
750	G.E.	New	750
200 (2)	Westg.	SK	900
250	C.W.	CCD	1200
200	El. Mchy.		900
150	G.E.	MPC	1200
125	El. Dy.		1800
135 (2)	G.E.	MPC	1200
100 (2)	Westg.	SK-145	1200
100 (3)	Delco		1200
75	C.W.	SE-CD	1150

600 VDC MG SETS

KW	Make	Type	Speed
425	G.E.	MPC	1200
400	G.E.	MPC	720
200	Westg.	SK-185	1200
75 (2)	Westg.	SK-144	1750
50	G.E.	BC	1150
30	G.E.	CD-1127Y	1150

125 VDC MG SETS

KW	Make	Type	Speed
200	Westg.	SK	900
150	Westg.	SK	1200
100	G.E.	RC-17	1200
100	El. Mchy.	651-T	1200
100	G.E.	MPC	900
75 (2)	G.E.	RC-36	1200
50	Westg.	SK-153L	1160

LOW VOLTAGE DC MG SETS

Amps	Volts	Make	Speed
3200	60	G.E.	1160
800	60	Westg.	1160
900	53	Hertner	1150
500	50	G.E.	850
1000 (4)	45	G.E.	900
1500 (5)	40	Century	900
200	35	Westg.	1750
100	33	G.E.	1800
200	33	G.E.	1800
2000 (2)	30	G.E.	720
1000/500	6/16	Bogue	1200
1000/500	6/12	Bogue	1200
5000/2500	6/12	Chandy	390

LOW & HIGH FREQ. AC MG SETS

Size	Make	Cycle
10 KW	G.E.	15
200 KW (2)	Westg.	120
220 KVA	G.E.	150
154 KVA	G.E.	150
15 KW	G.E.	180
208 KVA	G.E.	180
7½ KW	G.E.	420

230 VOLT DC MOTORS

H.P.	Make	Type	Speed
350 (4)	G.E.	MPC	1160
250	Reliance	2600-T	600/800
250	Cr-Wh.	H.B.	1000
150	G.E.	RC-36	1700
150	Westg.	SK-183	1160
125	Westg.	SK-178	850
125	Reliance	1050-T	600
100	G.E.	RC-36	950
100 (2)	Westg.	SK-160	1160
100 (3)	Westg.	SK-173	850
100	Reliance	651-T	850
100	Reliance	1050-T	500
75 (3)	Westg.	SK-153	1150
75	Reliance	461-T	850
75	C.W.	CMC	375/950
60	G.E.	CDP-102	1750
50 (2)	G.E.	RC-31B	1700

SLIP RING MOTORS

H.P.	Make	Type	Speed
600/800	G.E.	IM	257
600	C.W.	131A	514
500	Westg.	CW (Rod. Gear)	94
500 (2)	G.E.	IM	450
450 (2)	G.E.	IM-17B	880
400	G.E.	IM	900
350	Westg.	CW	438
300	Westg.	CW	1175
250	G.E.	IM-17	880
200 (2)	Westg.	CW-875C	1760
100	Westg.	CW-868A	695
100	El. Dy.		690

SYNCH. MOTORS

H.P.	Make	Type	Speed
700	Westg.		450
600	Westg.		450
600	G.E.	TS	1200
475	Westg.		720
200 (2)	A.C.		1200
180 (2)	G.E.	ATI	900
150	G.E.	TS-9658	720
100	G.E.	ATI	720
100	Westg.		600
40	G.E.	TS-7536	900
30	G.E.	TS-7432	900

SQ. CAGE MOTORS

H.P.	Make	Type	Speed
250	G.E.	K-6338	1800
200 (2)	G.E.	IK	1800
200 (4)	G.E.	IK	1150
150 (2)	Westg.	CR-771C	1760
150	C.W.	SC-333R	1750
150	Westg.	CR	1175
125	Westg.	CR-856C	700
100	Westg.	CR	1760
100 (2)	Westg.	CR	870
100	Westg.	CR-956A	388

PHONE—WIRE—WRITE
Your Requirements

L. J. LAND, INC.
Established 1910
150 GRAND STREET, NEW YORK 13, N. Y.
CAnal 6-4976

RAILS
FOR IMMEDIATE DELIVERY

500 Tons 80# ASCE	Relay
400 Tons 90# ARA-B	Relay
150 Tons 90# ASCE	Relay

TIE PLATES • Excellent Relay
TURNOUTS—LIGHT RAILS
TRACK ACCESSORIES

MORRISON
RAILWAY SUPPLY CORP.
814 Rand Bldg. Buffalo 3, N. Y.
MOhawk 5826

REBUILT AND NEW
GUARANTEED MOTORS
M.G. SETS • GENERATORS
Hoists • Compressors • Transformers
Units of Every Size and Description

MOTOR GENERATOR SETS

K.W.	MAKE	A.C.	D.C.
1000 (3u)	Westg.	11000	137/275
500	Westg.	2300	137/275
500	Westg.	2300	275
400	AC	2300	120/240
250	Westg.	2300	125/250
200	G.E.	2300	250
200	Westg.	4160	250
200	Ridgeway	2300	250
170	G.E.	440	125
150	G.E.	2300	125/250
150	G.E.	4000	250
150	A.C.	2300	275
150	Westg.	2300	125/250
150	G.E.	440	275
100	G.E.	2300	250
100	Westg.	440	125
100	Elec. Mach.	440	125
100	G.E.	440	125
90	G.E.	440	60
75	G.E.	440	125
60	Westg.	2300	125

WE'LL SELL, BUY OR TRADE
PHONE CANAL 6-2900
CHICAGO *Electric Co*
1335 W. CERMAK ROAD
CHICAGO 8, ILL.

RAILS *New and Relaying*
SPIKES & BOLTS
FROGS & SWITCHES
TIE PLATES
CREOSOTED TIES
HYMAN-MICHAELS CO.
122 S. MICHIGAN AVE., CHICAGO 3, ILL.

WORLD'S LARGEST INVENTORY
FREE CATALOG
MOTORS—GENERATORS—TRANSFORMERS
New and Guaranteed Rebuilt
1 H.P. to 2500 H.P.
ELECTRIC EQUIPMENT CO.
P. O. BOX 51, ROCHESTER 1, N.Y.

REDUCTION GEARS
300 KW General Electric High Speed 3.6:1
150 HP, Fawcus double reduction 11.7:1
125 HP, Farrel-Birmingham 4.72:1 2 HP
James Planetary 85.75:1 60 HP, varipitch 860 to 1385/460 2 HP, variable speed 1140 to 23.8/2.38
P. H. CRAWFORD & CO., INC.
30 Church St., New York 7, N. Y.

EQUIPMENT AND MATERIALS WANTED

WANTED
SURPLUS STEEL
WALLACK BROTHERS
7400 S. Damen Ave. Chicago 36, Illinois

WEISS STEEL CO. INC.
600 WEST JACKSON BLVD.
CHICAGO 6, ILLINOIS
Buyers of Surplus Steel Inventories
36 Years of Steel Service

WE BUY AND SELL USED
OVERHEAD TRAVELING CRANES
STRUCTURAL BUILDINGS
Your Offerings and Inquiries Solicited
BENKART STEEL & SUPPLY CO.
CORAOPOLIS, PA.

WANTED
BRIDGE CRANES
ARNOLD HUGHES COMPANY
765 PENOBSCOT BLDG. DETROIT, MICH.
WOodward 1-1894

WANTED SURPLUS AIRCRAFT MATERIAL
Hardware and Fittings;
Stainless-Aluminum-Steel-Brass (Rod & Bar)
Any size, type and quantity.
Get our cash offer by return mail.
Send lists to:
COLLINS ENGINEERING COMPANY
9050 Washington Blvd., Culver City, Calif.

WANTED ANVIL FOR ERIE 5000# AIR-OPERATED DROP HAMMER OR COMPLETE HAMMER OF COMPARABLE TYPE AND SIZE.
LeTourneau-Westinghouse Company
Purchasing Dept. — P.O. Box 240
Peoria, Illinois

WANTED
Second-hand flattening roller levellers and shears. Capacity from 28 gauge to 1 stroke 8" width 54" and up. Quote lowest price.
ADDRESS BOX C-834
Care *The Iron Age*, 100 E. 42nd St., New York 17

WANTED
Plate Bending Rolls, 20' to 40' long.
50-Ton Portable Rivet Squeezers.
Wagon Drills & Rock Drills (Heavy Duty).
(2) 2½ yd. Shovels, Northwest 80D or equiv.
(3) Tractors, Caterpillar D8 or equiv.
Please furnish photo and best resale prices.
Axles (2000) for freight cars, new only.
Also all types air tools and Magnaflux machines.
Montgomery Engineering Co., 1796 W. Phila. Detroit 6, Mich. TRinity 4-0929

— WANTED —
TEMPERED SPRING STEEL-COILS
½" x .018/.020 Any Finish
Cannot use slit or burr edge stock.
SEABOARD STEEL CO., INC.
10 Fair St., New Haven, Conn.
UN 5-0929

BUSINESS OPPORTUNITIES

Opportunity For Progressive Metal Working Firm . . .

Leading Belgian Steel Works seeks connection with U.S. industrial plants for manufacture under license of various products. Company makes hoisting and handling equipment and operates important cold drawing mill and hot forging plant for bolts, etc. Inquiries should be addressed to:

Marcel Loeb & Company, Inc.
30 CHURCH STREET
NEW YORK 7, NEW YORK

PLANTS FOR SALE

STRUCTURAL AND PLATE SHOP. 31,000 sq. ft. 10 yr. old bldg. equipped for large work. 10 ton and 15 ton cranes with 36 ft. clearance. R. R. siding. Price $205,000. Terms $80,000 cash, bal. long term mortgage without interest.

BOILER SHOP. sale or lease. 30,000 sq. ft. bldg. fully equipped. 10 ton crane and R.R. siding in bldg. Large yard.

GRAY IRON Foundry producing castings up to 5 tons. Daily capacity 25 tons. Excellent organization. Serves New York, Phila., market.

EDWARD H. ZOLL
Industrial Properties Throughout the East
790 Broad St. Newark 2, N. J.
Phone Mitchell 2-2450

Have you any factories or plant sites to sell? This space would place you in touch with interested parties, as over 100,000 men read

THE IRON AGE

STEEL MEN
You may have inventions that can be profitably marketed. We are manufacturers of small fittings and equipment that are sold to steel mills. If you have a suitable patented idea, we will develop, manufacture and market it on royalty.
ADDRESS BOX C-787
Care *The Iron Age*, 100 E. 42nd St., New York 17

MACHINE SHOP, San Francisco. Net $47,092 in 7 months—after taxes! Started in 1946 on a shoestring, now debt free! Good industrial location. Complete equipment in good condition. Very reasonable price. Terms. #21262, FORD, 6425 Hollywood Blvd., Los Angeles 28, Calif.

Try the
WANTED SECTION
for
"Hard-to-Find"
Materials or Equipment

CONTRACT MANUFACTURING DIRECTORY

The directory of production services. (This section appears in the first and third issues of each month.)

GEM INSULATING FIREBRICK

★

THE GEM CLAY FORMING CO.
SEBRING, OHIO

OLSON SCREW MACHINE PRODUCTS

Made to your specifications and tolerances. From smallest up to 2⅝" diameter in steel, brass and aluminum.

OLSON MANUFACTURING CO.
100 Prescott St., Worcester, Mass.

STAMPINGS — ASSEMBLIES

To drawing or sample

Drilling	Forming
Blanking	Tapping
Riveting	Welding

DESIGN & DEVELOPMENT
Toolmaking of Course

HUEBEL MFG. CO., INC.
763 Lexington Avenue
Kenilworth, N. J.

Nepsco

NEW ENGLAND PRESSED STEEL COMPANY
Contract Manufacturer since 1914
METAL STAMPINGS
SPECIALTIES – APPLIANCES
For Industrial and Domestic Users
P. O. BOX 29
NATICK MASSACHUSETTS

STANDARDIZE WITH STANDARD

MADE TO YOUR SPECIFICATION
STEEL TUBING
CARBON · ALLOY AND STAINLESS
SEAMLESS OR WELDED
PRESSURE AND MECHANICAL
MILL OR WAREHOUSE QUANTITIES
STANDARD TUBE SALES CORP.
76-01 WOODHAVEN BLVD. · BROOKLYN 27, N. Y.

DROP FORGE DIES

Forging Engineers—Die sinkers—Manufacturers of drop forge dies and hot work tools for presses and upsetters.

COMMERCIAL DIE COMPANY
7851 Intervale Ave., Detroit 4, Mich.
Phone: WEBSTER 3-7104 Cable Code "Comdie"

FORGINGS

Flat die forgings to your specifications
The Columbus Anvil & Forging Co.
123 West Frankfort
Columbus, Ohio Hickory 4-2107

THE FORMULA:

Multi-operation presses
plus
Yankee skilled workmen
over
Eighty years' manufacturing
know-how equals
Low cost metal stampings
And precision assemblies
To meet your needs

The GREIST MANUFACTURING CO.
New Haven 15, Conn.

STA-FAST STEEL WEDGES

sharp edges give holding power like a screw
Self-Aligning
Steel Belt Fasteners
Standard Steel Rivets
used with
Self-Aligning Fasteners
STAMPINGS
PUNCHINGS
WASHERS
to your specifications
Catalog sent upon request

SALING MANUFACTURING COMPANY
Standard-Belt-Fastener Division
UNIONVILLE, CONNECTICUT

SPECIAL MACHINERY

DIAMITE *Abrasive Resistant* Castings
NI RESIST *Heat & Corrosion Resistant* Castings
P M G BRONZE *High Strength Acid Resistant* Castings
Fully Equipped—Pattern Foundry & Machine Shop Facilities—Castings to 15 tons.
Weatherly Foundry & Mfg. Co., Weatherly, Pa.

DROP FORGINGS

Special Forgings of Every Description.
We solicit your prints or model for quotation.

Wilcox Forging Corporation
Mechanicsburg Penna.

FORGINGS

Hammered Steel Forgings
UP TO 6,000 LBS. EACH

ALL TYPES
Smooth Forged — Finished — Rough Turned
Hollow Bored
and Heat Treated to Specifications
CRANKSHAFTS—SHAFTING
CONNECTING RODS
Roll—Gear Blanks—Pinions and Miscellaneous Forgings

BAY CITY FORGE CO.
ERIE, PA.
Over a Quarter of a Century of Dependable Service and Quality Products

Gray Iron and Semi Steel Castings, also alloyed with nickel, chrome, and molybdenum. Wood and Aluminum pattern work.

KING FOUNDRIES, INC.
Phone 825 North Wales, Montg. Co., Pa.
22 Miles from Philadelphia, Pennsylvania

DROP FORGINGS

To Your Specifications
Prompt Quotations

BALDT ANCHOR CHAIN & FORGE DIVISION
P. O. Box 350—Chester, Pennsylvania

CONTRACT MANUFACTURING

Contract Machine Work
Parts and Complete Machines, Heat Treating and Grinding. Mail Blue Prints for Quotations.
GENERAL MACHINE WORKS
York, Pa.

Special Washers
We carry in stock Silicon killed steel specially suited for case-hardening. Stock dies for producing washers from .0015 to ½" thick.
Thomas Smith Company
294 Grove St., Worcester, Mass.

10 to 12 ft. lengths
ALL METALS
Also special screw machine products to order
EASTERN
MACHINE SCREW CORPORATION
New Haven, Conn.
Makers of
H & G DIE HEADS

BUYERS:

To Locate a source of supply for that "Hard-to-find" material try an ad in the

WANTED SECTION of THE IRON AGE

EMPLOYMENT EXCHANGE

The meeting place for employers and men qualified for positions in the metalworking industry.

Help Wanted Rates
Employment Service Rates
Representatives Wanted Rates
Accounts Wanted Rates

Set Solid—50 words or less.....$16.00
Each additional word..... 25c
All capitals—50 words or less.....$16.00
Each additional word..... 32c
All capitals, leaded—50 words or less....$19.50
Each additional word..... 39c

Situation Wanted Rates
Payable in Advance
Set solid—25 words or less.....$2.50
Each additional word..... 10c
All capitals—25 words or less.....$3.75
Each additional word..... 15c
All capitals, leaded—25 words or less.....$5.00
Each additional word..... 20c

COUNT SEVEN WORDS FOR KEYED ADDRESS

EMPLOYMENT SERVICE

SALARIED PERSONNEL $3,000-$25,000—This confidential service, established 1927, is geared to needs of high-grade men who seek a change of connection under conditions assuring, if employed, full protection to present position. Send name and address only for details. Personal consultation invited. JIRA THAYER JENNINGS, Dept. K, 241 Orange St., New Haven 1, Conn.

HELP WANTED

ASS'T. SUPERINTENDENT — Cold Drawn Mill in East has opening for young man 23-30 graduate of college or technical school. Should have some engineering and production line experience. Replies will be held confidential. Address Box C-839, care *The Iron Age*, 100 E. 42nd St., New York 17.

HELP WANTED

ENGINEERING GRADUATES
OPPORTUNITY WITH SMALL MIDWESTERN STEEL PLANT. RECENT METALLURGICAL GRADUATES PREFERRED FOR STEEL PLANT OBSERVATION WORK. GOOD STARTING SALARY AND OPPORTUNITY TO WORK INTO SUPERVISION.
ADDRESS BOX C-837
Care *The Iron Age*, 100 E. 42nd St., New York 17

ACCOUNTS WANTED

DIE CASTINGS OR HEAVY DROP FORGINGS needed as additional line for an established active sales organization, Philadelphia office, calling on all metal industries in N. J., Penna., Del., Md. area. Must be established company able to produce quality product competitively for eastern manufacturer. Address Box C-835, Care *The Iron Age*, 100 E. 42nd St., New York 17.

SITUATIONS WANTED

TRANSPORTATION SUPERINTENDENT OR ASSISTANT—15 years supervisory experience including carrier railroad and all phases integrated steel plant transportation. 2 years management training. Under 40. Address Box C-838, Care *The Iron Age*, 100 E. 42nd St., New York 17.

SHOP

Through the Contract Manufacturing Section for the Plant with the Facilities to do your Work

. . . DON'T HIDE YOUR LIGHT UNDER A BUSHEL . . .

Have something new on the market or do you just want to tell why your product does the job better? Either way, your advertisement in The Iron Age carries more weight and reaches more of your prospects.

ADVERTISERS IN THIS ISSUE

An asterisk (*) beside the name of advertiser indicates that a booklet, or other information, is offered in the advertisement. Write to the manufacturers for your copies today.

A

Aaron Machinery Co., Inc..... 370
*Acheson Colloids Co. 55
Acorn Iron & Supply Co..... 270
Adamas Carbide Corp..... 308
*Air Reduction 259
Ajax Electric Co., Inc..... 4
Ajax Electric Furnace Corp..... 4
Ajax Electrothermic Corp. 4
Ajax Engineering Corp. 4
*Ajax Manufacturing Co., The.... 207
Alan Wood Steel Co..... 216
*Aldrich Pump Co., The..... 110
*Alemite Div., Stewart Warner Corp. 233
Allegheny Ludlum Steel Corp. Between Pages 96 & 97
*Allen-Bradley Co. Between Pages 64 & 65
Alliance Machine Co., The..... 155
*American Broach & Machine Co. 262
American Electric Fusion Corp. Between Pages 96 & 97
American Gas Association 156
*American Gas Furnace Co..... 125
*American Manganese Bronze Co. 383
*American Monorail Co., The.... 23
*American Non-Gran Bronze Co. 270
*American Pulverizer Co. 251
American Shear Knife Co..... 264
*American Steel Foundries, King Machine Tool Div. 141
American Steel & Wire Div., United States Steel Corp. Between Pages 32 & 33
*Apex Machine & Tool Co., The.. 250
*Apex Tool & Cutter Co..... 382
*Armco Steel Corp. 6
Armel, James P. 376
*Armstrong-Blum Manufacturing Co. 68
*Armstrong Bros. Tool Co..... 264
*Atlas Car & Mfg. Co., The..... 86
*Atlas Chain & Manufacturing Co. 8
Automatic Steel Products, Inc.... 312

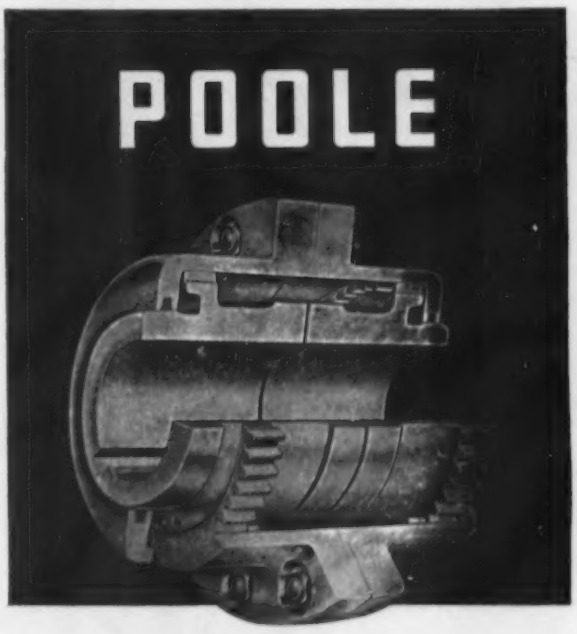
B

Babcock & Wilcox Co., The Tubular Products Div. 220
Bailey, William M., Co..... 157
*Baird Associates, Inc. 128
Baird Machine Co., The..... 82
Baker, J. E., Co., The..... 20
*Baker Industrial Truck Div. of The Baker-Raulang Co. 10
Baldt Anchor, Chain & Forge Div. 379
Baldwin-Lima-Hamilton Corp. ... 113
Baldwin-Lima-Hamilton Corp., Construction Equipment Div..... 147
Baush Machine Tool Co..... 34
Bay City Forge Co..... 379
Bay State Abrasive Products Co. 46, 47
Belyea Co., Inc. 377
Benkart Steel & Supply Co..... 378
Bennett Machinery Co. 374
Bertsch & Company 356
Bethlehem Steel Co. 1
Blak Iron Work 384
Billings & Spencer Co., The..... 382
*Binks Manufacturing Co. 318
Birdsboro Steel Fdry. & Machine Co.....Between Pages 232 & 233
*Blanchard Machine Company, The 76
Blaw-Knox Co., Machinery Division 73
*Bliss, E. W., Co., Press Div..... 129
*Boston Gear Works 70
Boston Metals Co., The.....376, 377
Bridgeport Brass Co. 106
*Brighton Screw & Mfg. Co., The 123
Bristol Brass Corp., The..... 28
*Brooks Oil Co., The..... 126
Brownell, Hazard, Machine Tools, Inc. 374
Browning, Victor R., & Co., Inc... 131
*Buck Mfg. Co. 299
Bucyrus-Erie Co. Between Pages 96 & 97
*Buffalo Forge Co. 122
*Buhr Machine Tool Co. 65
*Bundy Tubing Co. 90
*Bunting Brass & Bronze Co..... 316

C

Carborundum Co., Abrasive Div. Between Pages 144 & 145
Carlson, G. O., Inc. 261
Carpenter Steel Co., The..... 241

(Continued on Page 382)



A COPY OF CATALOG GIVING FULL DESCRIPTION AND ENGINEERING DATA SENT UPON REQUEST.

FLEXIBLE COUPLINGS

POOLE FOUNDRY & MACHINE COMPANY — WOODBERRY, BALTIMORE, MD.

APEX TOOLS

INSERTED-BLADE MILLING CUTTERS

Here's a PRODUCTION Cutter

for your

HEAVY DUTY JOBS

APEX offers many cutters for many jobs. Here's one that takes a big chip fast. It can be had with H.S.S., Stellite, Cobalt or Carbide tipped blades. These blades adjust automatically in two directions. No damage to carbide tips. Diameters from 8" to 24". We also make cutters for *lighter* work.

Write for catalog.

APEX TOOL & CUTTER CO., Inc., Shelton 12, Conn.

looking for

FORGINGS?

Large or small—Light or heavy—Simple or complex . . . Billings drop forging engineers and craftsmen have the equipment and skill to meet every forging requirement.

For details – send your specs to 40 Laurel Street

Contact **BILLINGS**

QUALITY TOOLS AND FORGINGS SINCE 1869

THE BILLINGS & SPENCER CO.
HARTFORD 1, CONN., U.S.A.

ADVERTISERS IN THIS ISSUE

(Continued from Page 381)

*Carpenter Steel Co., The Alloy Tube Div. 158
Cattie, Joseph P., & Bros. 384
Central Steel & Wire Co. 115
Challenge Machinery Co. 269
*Chemical Corp., The 269
Chicago Electric Co. 377
Chicago Freight Car & Parts Co. 356
Chicago Rawhide Manufacturing Co. 162
*Cincinnati Bickford Tool Co., The 60, 61
*Cincinnati Gilbert Machine Tool Co. 25
*Cincinnati Shaper Co., The ... 58, 59
Cleveland-Cliffs Iron Co., The ... 40
*Cleveland Metal Abrasive Co., The 33
Cleveland Punch & Shear Works Co., The 144
Cleveland Steel Tool Co., The ... 386
*Cleveland Tapping Machine Co. 312
*Cleveland Tramrail Division, The Cleveland Crane & Engineering Co. 44, 45
Cold Metal Products Co., The 224
Collins Engineering Company ... 378
*Colonial Broach Co. 142
Colorado Fuel & Iron Corp., The Wickwire Spencer Steel Div. Between Pages 64 & 65, 362
Columbia-Geneva Steel Div., United States Steel Corp. Between Pages 32 & 33, 62 & 63
Columbus Anvil & Forging Co. ... 379
Commercial Die Co. 379
*Conco Engineering Works, Crane & Hoist Div. 243
*Cone Automatic Machine Co., Inc. 120
Consolidated Machine Tool Corp. 56, 57
Consolidated Railway Equipment Co. 376
*Continental-Diamond Fibre Co. 111
*Continental Steel Corp. 127
Continental Tool Works Div. of Ex-Cell-O Corp. 322
*Cooper Alloy Corp. 254
Cowles Tool Co. 386
Cox & Sons Co., The 386
Crawford, F. H., & Co., Inc. 377
*Cromwell Paper Co. 81
Cro-Plate Co., Inc. 284
Cross Company, The 84
Crucible Steel Casting Co. 383
*Crucible Steel Co. of America .. 117
Cutler-Hammer, Inc. ..... Back Cover

D

Darien 375
Davenport Besler Corp., Davenport Locomotive Works 54
Davis Keyseater Co. 384
Dempster Brothers, Inc. 66, 67
Detroit Stamping Company 271
*Diamond Manufacturing Co. 365
Differential Steel Car Co. 260
*Dodge Manufacturing Corp. 32
Donahue Steel Products Co. 375
Dony, D. E. Machinery Co. 374
Dreis & Krump Mfg. Co. 386
*Duct-O-Wire Co. 306
*Du Pont de Nemours, E. I., & Co., Inc., Electrochemicals Dept. 35
Duraloy Co., The 242
Dykem Company, The 385

E

Eastern Machine Screw Corp., The 302, 380
Eastern Machinery Co., The 373
Eastern Tool & Stamping Co., Inc. 361
Eastman Kodak Co. 359
Easton Car & Construction Co. ... 266
Edmont Manufacturing Co. 246
*Elastic Stop Nut Corp. of America 69
Electric Controller & Mfg. Co., The 118
Electric Equipment Co. 377
*Electric Storage Battery Co., The 80
Electro Metallurgical Co., a Div. of Union Carbide & Carbon Corp. 38, 39
*Electrolizing Corp., The 21
Emerman Machinery Corp. 369
*Erie Foundry Co. 114
Espen-Lucas Machine Works, The 235
*Euclid Crane & Hoist Co., The .. 75
Ex-Cell-O Corporation 322
Excelsior Leather Washer Mfg. Co. 267

F

*Fairfield Manufacturing Co. 292
Falk Machinery Co. 375
*Farrel-Birmingham Co., Inc. ... 129
*Fate-Root-Heath Co. 116

ADVERTISERS IN THIS ISSUE

*Federal Bearings Co., Inc..... 72
*Federal Press Co., The..... 102
*Federal Products Corp. 278
Fellows Gear Shaper Co., The..18, 19
*Ferry Cap & Set Screw Co., The 79
Finkl, A., & Sons Co..... 100
Flexivise Co. 300
Ford 378
Foster, Frank B., Inc..... 371
Frank, M. K. 376

G

Galbreath Machinery Co. 374
*Gallmeyer & Livingston, Inc.... 314
*Garlock Packing Co., Inc.....237
*Garrett, Geo. K., Co., Inc..... 319
Gem Clay Forming Co., The..... 379
General Machine Works 380
Gisholt Machine Co. 140
*Gleason Works 71
Goodman Electric Machinery Co. 376
Goss & DeLeeuw Machine Co.... 385
Granite City Steel Co..... 363
*Graver Tank & Mfg. Co., Inc.... 48
Gray, G. A., Company..... 89
Great Lakes Steel Corp..... 211
Greenlee Bros. & Co..... 105
Greist Manufacturing Co. 379
Griffin Manufacturing Co. 362

H

Halldan Machine Co., The..... 298
Hannifin Corp. 300
Hansen Manufacturing Co. 310
Hanson-Van Winkle-Munning Co. Between Pages 64 & 65
Harbison-Walker Refractories Co. 34, 37
*Hartford Special Machinery Co., The 119
*Harvey Aluminum Div., Harvey Machine Co., Inc. 145
Haynes Stellite Company, a Div. of Union Carbide & Carbon Corp. 151
Hayward Company, The 384
Hendrick Manufacturing Co. 244
Henry, A. T., & Company, Inc.... 367
*Holcroft & Company 304
*Houghton, E. F., & Co..... 146
Huebel Mfg. Co., Inc..... 379
Hughes, Arnold, Co.....376, 378
Hyde Park Foundry & Machine Co. 135
*Hydraulic Press Mfg. Co., The.. 153
Hydropress, Inc., Loewy Rolling Mill Div. 103
Hyman, Joseph, & Sons.....372, 374
Hyman-Michaels Co. 376

I

Independent Engineering Co..... 271
Industrial Brownhoist Corp. 24
Ingersoll Steel Division, Borg-Warner Corp. 41
International Nickel Co., Inc., The 143
Interstate Machinery Co., Inc. ... 373
Iron & Steel Products, Inc..... 366
Ironsides Co., The 293

J

*Johns-Manville Corp. 134
Johnson Bronze Co. 315
Jones & Laughlin Steel Corp...22, 104

K

Kaiser Aluminum & Chemical Sales, Inc., Chemicals Div..... 274
Kane & Roach, Inc..... 130
Kaplan, M. S., Company..... 329
*Kaydon Engineering Corp., The.. 291
Kellte Products, Inc. 263
*Kemp, C. M., Mfg. Co., The... 297
Kennametal, Inc. 52, 53
*Kester Solder Co. 258
Kidde, Walter, & Co., Inc..... 13
King Foundries, Inc. 379

(Continued on Page 384)

HERE'S THE STRONGEST BRONZE

HY-TEN-SL

A Bronze as Strong as Nickel Steel

TRADE-MARK

Grade of HY-TEN-SL	1AA	1A	1	2	3	4
TENSION						
Ultimate tensile strength lbs. per sq. in.		(Minimums)				
Sand Cast	125,000	115,000	100,000	100,000	90,000	85,000
Rolled 1" and under	.....	120,000	110,000	105,000	95,000	85,000
Rolled or Forged, over 1"	.....	115,000	105,000	100,000	90,000	85,000
Yield Point (divider method)						
Sand Cast	95,000	75,000	60,000	55,000	45,000	40,000
Rolled 1" and under	.....	75,000	65,000	60,000	50,000	45,000
Rolled or Forged, over 1"	.....	75,000	65,000	60,000	50,000	45,000
Elongation in 1"—%						
Sand Cast	10	12	14	15	20	25
Forged or Rolled	.....	12	13		15	20
Reduction in area—%						
Sand Cast	.....	12	14	15	20	25
Forged or Rolled	.....	12	13		15	20
COMPRESSION						
Yield Point— lbs. per sq. in.	70,000	65,000	58,000	50,000	40,000	35,000
Permanent Set at 100,000 lbs. per sq. in. (max.)	.015	.020	.030	.050	.090	.125
Brinell hardness, No.	250	240	220	200	175	150

List of U. S. Government Specifications Covering HY-TEN-SL Bronze

ARMY
Forgings, Rolled Rod QQ-B-721 Class B
Castings...QQ-B-726 Class B and C

NAVY
Forgings and Rolled Rod 46B13d Class B
Castings, Aluminum-manganese Bronze 46B29

WATERTOWN and OTHER ARMY ARSENALS
Castings WS-5
Forgings and Rolled Rod.....WS-2

NAVAL GUN FACTORY
Washington Navy Yard
Castings—Trunnion Metal.....G.S.SB

AIRCRAFT
See Navy and Army (above).

Send for 46 Page "Text Book"

AMERICAN MANGANESE BRONZE COMPANY

4701 RHAWN ST., PHILADELPHIA 34, PA.

Established 1909

C

ELECTRIC FURNACE

STEEL CASTINGS

If you are interested in minimum machining and assembly costs — ease of welding — better distribution of metal — better strength and weight ratios — better fit — better performance — greater fatigue resistance — longer life and less replacement — you should be interested in "C" electric furnace steel castings because these foundry engineered castings give you steel at its best. And — by virtue of alloy and heat treating — they offer you a choice of mechanical properties to fit your specific needs.

Investigate!

Perhaps by cooperating with your engineers in details of design and pattern we may be able to help you achieve improved production at lower costs.

CRUCIBLE STEEL CASTING CO.

LANSDOWNE, PENNA.

Handles scrap — and how!

Here's the powerful, husky Class K Hayward you see in so many mills and plants everywhere. You can't beat this popular bucket for handling turnings! And other scrap, too!

Write for details. The Hayward Company, 50 Church Street, New York 7, N. Y.

HAYWARD BUCKETS

CLAM SHELL • ELECTRIC • ORANGE PEEL • GRAPPLES

famous for performance since 1888

SWEDISH WROUGHT IRON

Bar Stock available in New York

Sole Importers of Kohlswa Crown Star Anvils

Saw Makers & Horseshoers pattern

TOOL STEEL • DRILL STEEL • SPRING STEEL

SWEDISH-AMERICAN STEEL CORP.

421 Kent Ave., BROOKLYN 11, N. Y.

Phone STagg 2-3000

THE NEW BILAK SCRAPERS

SCRAPERS

FLAT — HALF ROUND

No. 282 Flat Scraper, ½" wide, 14" long $2.95

No. 101 Half Round Scraper, ¾" wide, 14" long $2.95

BILAK IRON WORKS

157 Hillside Ave. Torrington, Conn.

HOT DIP GALVANIZING

JOSEPH P. CATTIE & BROTHERS, INC.

2520 East Hagert St.

Phone: Re 9-8911 Phila. 25, Pa.

"DAVIS" KEYSEATER

Low in Cost. Durable.

Easy to operate.

Table adjustable for straight or taper keyways.

Three sizes. Keyways 1/16" up to 1".

DAVIS KEYSEATER CO.

400 Exchange St.

Rochester 8, N. Y.

ADVERTISERS IN THIS ISSUE

(Continued from Page 383)

Kingsbury Machine Tool Corp...42, 43
Kinnear Manufacturing Co., The.. 311
Knox, Earl E., Co. 375

L

Laclede Steel Co. 29
Laffrey Steel Co. 376
Land, L. J., Inc. 377
Landis Machine Co., Inc. 14, 15
Lang Machinery Co. 377
Lansing Stamping Co. 270
Leland-Gifford Co. 366
Le Tourneau-Westinghouse Co. ... 378
Lewis Machine Co., The 270
Linde Air Products Co., a Div. of Union Carbide & Carbon Corp. 83, Between Pages 128 & 129
*Lodge & Shipley Co., The 208
Loeb, Marcel, & Company, Inc... 378
*Logan Co. 249
*Lovejoy Flexible Coupling Co... 386
Lumnite Div., Universal Atlas Cement Co. ..... Between Pages 32 & 33
Lurie Bros. & Co., Inc. 327

M

McKay Machine Co., The 137
McLouth Steel Corp. Between Pages 128 & 129
MacCabe, T. B., Co. 377
Machine Tools Sales Co. 375
*Mahon, R. C., Co., The 78
Manhattan Rubber Div., Raybestos-Manhattan, Inc. 152
*Manheim Mfg. & Belting Co. 161
Marshall Railway Equip. Corp... 376
*Mattison Machine Works 138
*May-Fran Engineering, Inc. ..280, 281
Meaker Co., The 252
Mesta Machine Co. ..... Front Cover
*Metalwash Machinery Corp. 11
Michigan Steel Tube Products Co. 236
Mid-West Abrasives Co. 94
Miles Machinery Co. 375
Mississippi Valley Equipment Co. 376
Montgomery Engineering Co. ..375, 378
Morgan Construction Co. 5
Morrison Railway Supply Corp... 376
*Morton Mfg. Co. 305
*Mueller Brass Company 317
*Mundt, Chas., & Sons 88

N

*National Broach & Machine Co. 112
National Machinery Exchange 368, 374
National Malleable & Steel Castings Co. 307
National Roll & Foundry Co. 283
National Steel Corp. 159, 211
National Tube Div., United States Steel Corp. Between Pages 32 & 33, 62 & 63
New Departure Div., General Motors Corp. 85
New England Pressed Steel Co... 379
New York Rubber Corp. 376
*Niagara Machine & Tool Works 98, 99
Nice Ball Bearing Co. 381
*Northern Engineering Works.... 248
Norton Company 50, 51

O

O. K. Tool Co., Inc., The 379
O'Connell Machinery Co. 374
*O'Neil-Irwin Mfg. Co. 9
O'Neill, A. J. 376
*Ohio Crankshaft Co., The 109
*Oliver Corp., The, A. B. Farquhar Div. 238
Olson Manufacturing Co. 360, 379
*Obran, Kurt, Co., Inc. 77
Ornitz Equipment Corp. 376
Ottemiller, Wm. H., Co. 386

P

*Pedrick Tool & Machine Co. 364
Peerless Steel Specialties Co. 377
Penn Crane-Rail Co. 385
Pennsylvania Engineering Corp... 93
Perkins Machine & Gear Co. 245
*Peterson Steels, Inc. 294
Philadelphia Gear Works, Inc.... 154

ADVERTISERS IN THIS ISSUE

Pickands, Mather, & Co..... 108
Pittsburgh Crushed Steel Co..... 282
**Platecoil Div. of Tranter Mfg., Inc.....Between Pages 208 & 209
Plume & Atwood Mfg. Co. Between Pages 64 & 65
*Plymouth Locomotive Works Div. of The Fate-Root-Heath Co..... 116
*Poole Foundry & Machine Co.... 381
Power Press Specialists 374
*Pratt & Whitney, Div., Niles-Bement-Pond Co. 16, 17
Purdy Company, The 372
Pyrene—C-O-Two 96

R

Ransburg Electro-Coating Corp... 285
Raybestos-Manhattan, Inc., Manhattan Rubber Div. 152
Ready-Power Co., The 247
Reliance Steel Div., Detroit Steel Corp. 136
*Ren-ite Plastics, Inc..... 299
Rhode Island Tool Co..... 358
Richards, Arklay S., Co., Inc..... 303
Roebling's, John A., Sons Corp. Between Pages 128 & 129
*Rollway Bearing Co., Inc..... 357
Rotary Electric Steel Co..... 121
*Rotor Tool Company, The Inside Front Cover
Russell, Burdsall & Ward Bolt & Nut Co. 213
Ruthman Machinery Co., The..... 265
Ryerson, Jos. T., & Son, Inc..... 160

S

SKF Industries, Inc. 95
Saling Manufacturing Co..... 379
Sandusky Foundry & Machine Co. 239
*Sandvik Steel, Inc..... 124
*Scaky Bros., Inc. 150
Seaboard Steel Co., Inc. 378
Service Foundry Div. of Avondale Marine Ways, Inc. 364
Sessions, J. H., & Son..... 268
Sharon Steel Corp. 30, 31
*Shepard Niles Crane & Hoist Corp. 256
*Silent Hoist & Crane Co..... 267
Simmons Machine Tool Corp..... 276
*Simonds Abrasive Co. 97
Skelly Oil Co., Industrial Div.... 299
Smith, Thomas, Co. 380
*Southco Div., South Chester Corp. 321
*Standard Automotive Parts Co. 303
Standard Iron & Steel Co..... 376
*Standard Pressed Steel Co..... 132
*Standard Shop Equipment Co... 360
Standard Steel Works Div., The Baldwin-Lima-Hamilton Corp... 113
Standard Tube Sales Corp..... 379
Steel Shot & Grit Co., Inc..... 282
Steel & Tube Div., Timken Roller Bearing Co. 74
*Stonehouse Signs, Inc. 303
*Struthers Wells Corp. 301
*Sugar Beet Products Co..... 49
Superior Steel Corp. Between Pages 208 & 209
Swedish American Steel Corp.... 384

T

Tennessee Coal & Iron Div., United States Steel Corp. Between Pages 32 & 33
Thomas Machine Manufacturing Co. 149
*Tickle, Arthur, Engineering Works, Inc. 365
Timken Roller Bearing Co., The.. 277
Timken Roller Bearing Co., The, Steel & Tube Div..... 74
*Titan Metal Mfg. Co. Between Pages 232 & 233
*Tomkins-Johnson Co., The 240
Torit Manufacturing Co. 268
Torrington Co., The 87, Between Pages 240 & 241

DYKEM STEEL BLUE

Stops Losses making Dies and Templates

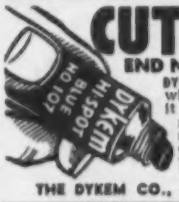
Popular package is 8-oz. can fitted with Bakelite cap holding soft-hair brush for applying right at bench; metal surface ready for layout in a few minutes. The dark blue background makes the scribed lines show up in sharp relief, prevents metal glare. Increases efficiency and accuracy.

Write for sample on company letterhead

THE DYKEM COMPANY
2303G North 11th St. • St. Louis 6, Mo.

CUT SCRAPER TIME

END NIGHT CLEANUP & MORNING REBLUING



DYKEM HI-SPOT BLUE No. 107 is used to locate high spots when scraping bearing surfaces. As it does not dry, it remains in condition on work indefinitely, saving scraper's time. Intensely blue, smooth paste spreads thin, transfers clearly. No grit; noninjurious to metal. Uniform. Available in collapsible tubes of three sizes. Order from your supplier. Write for free sample tube on company letterhead.

THE DYKEM CO., 2303G NORTH 11TH ST., ST. LOUIS 6, MO.

COWLES

GANG SLITTING KNIVES

OVER 30 YEARS EXPERIENCE

Standard for Service and Durability. Ground to extremely close Tolerances and Finish. Made by Toolmakers.

COWLES TOOL COMPANY
2086 W. 110th ST. CLEVELAND 2, OHIO

COX MACHINES

Pipe Cutting and Threading
Tube Cutting Off
Contract Machine Work

The Cox & Sons Company
Bridgeton, N. J.
Catalog upon request

ESTABLISHED SINCE 1868

CRANES—MONORAILS

HAND and ELECTRIC
UP TO FIVE TON CAPACITY
Furnished and Erected

PENN CRANE-RAIL COMPANY
2100 SO. 61ST STREET PHILADELPHIA 42, PA.
Phone BE 2-1736

GOSS and DE LEEUW

MULTIPLE SPINDLE
CHUCKING MACHINES
Tool Rotating Type
GOSS & DE LEEUW MACHINE CO., KENSINGTON, CONN.

(Continued on Page 386)

LOVEJOY
✓FLEXIBLE COUPLINGS
✓VARIABLE SPEED PULLEYS and TRANSMISSIONS
✓UNIVERSAL JOINTS
✓MOTOR BASES
Send for Catalogs on Company letterhead

LOVEJOY FLEXIBLE COUPLING CO.
4866 WEST LAKE STREET, CHICAGO 44, ILLINOIS

LELAND-GIFFORD
the BIG NAME in DRILLING MACHINES
LELAND-GIFFORD COMPANY, WORCESTER, MASSACHUSETTS

THE CLEVELAND STEEL TOOL CO.
Punches, Dies, Chisels, Rivet Sets
660 E. 82nd St., Cleveland, O.
If it's RIVETED you KNOW it's safe

CHICAGO
STEEL
PRESS BRAKES
43 Standard Sizes
DIES Punching and Forming for All Makes and Sizes of Press Brakes.

4909
DREIS & KRUMP MANUFACTURING COMPANY
CHICAGO
7430 S. Loomis Blvd., Chicago 36, Illinois

I'm the W.H.O.* of
WHO'S WHO
in the precision screw machine products field
Making the finest
COUPLING BOLTS CAP SCREWS
MILLED STUDS SET SCREWS
. . . our specialty.
Wm. H. Ottemiller Co. YORK, PENNA.
Ottemiller products are sold through Mill Supply Houses and Industrial Distributors.

ADVERTISERS IN THIS ISSUE

(Continued from Page 385)

Towmotor Corp. 286
Trabon Engineering Corp. Inside Back Cover
Tractor & Equipment Co. 376
Transue & Williams Steel Forging Corp. 214

U

*Udylite Corp., The 287
Union Carbide & Carbon Corp., Electro Metallurgical Co. 38, 39
Union Carbide & Carbon Corp., Haynes Stellite Co. 151
Union Carbide & Carbon Corp., Linde Air Products Co. 83, Between Pages 128 & 129
United Engineering & Foundry Co. Between Pages 96 & 97
United Wire & Supply Corp. 358
U. S. Burke The, Machine Tool Div. 91
United States Steel Export Co. Between Pages 32 & 33, 62 & 63
United States Steel Corp. Between Pages 32 & 33, 62 & 63
United States Steel Supply Div., United States Steel Corp. Between Pages 32 & 33, 62 & 63
U. S. Steel Wire Spring Co., The 303
Universal Machinery and Equipment Co. 374

V

Valley Mould & Iron Corp. 365
*Valvair Corp. 288
Vanadium Corp. of America 295
*Van Huffel Tube Corp. 107
*Vickers, Inc. 148
Victor Equipment Co. Between Pages 240 & 241
Virginia Gear & Machine Corp. ... 154

W

*Wade Tool Co., The 222
*Wagner Electric Corp. Between Pages 128 & 129
Wallack Bros. 378
Wapakoneta Machine Co., The ... 266
Ward Steel Co. 313
Washington Steel Corp. 265
*Waterbury-Farrel Foundry & Machine Co. 92, 218
Wean Engineering Co., Inc., The 26, 27
Weatherly Foundry & Mfg. Co. ... 379
*Webb, Jervis B., Co. 309
Weirton Steel Co. 159
Weiss Steel Co., Inc. 378
*Wellman Bronze & Aluminum Co., The 306
*Wheelock, Lovejoy & Co., Inc. ... 257
Wheland Co., The 268
Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp. Between Pages 64 & 65, 362
Wigglesworth Industrial Corp. .. 374
Wilcox Forging Corp. 379
*Wiley, John, & Sons, Inc. 362
*Willson Products, Inc. 255
*Wilson, Lee, Engineering Co., Inc. 133
Wisconsin Motor Corp. 253
Wood, R. D., Co. 12
Wyandotte Chemicals Corp. 272
Wyatt, C. G., Machinery Co., Inc. 374
Wyckoff Steel Co. 320

Y

Yale & Towne Mfg. Co., Powdered Metal Products Div. 296
Youngstown Sheet & Tube Co., The 54

Z

Zoll, Edward H. 378

CLASSIFIED SECTION

Business Opportunities 378
Clearing House 366-377
Contract Manufacturing 379-380
Employment Exchange 380
Wanted 378

How to cure a $1500-an-hour HEADACHE

You can't shut down an 80" hot strip mill for piggy-bank money. It costs about $1500 an hour to keep one going at full profit tilt.

So it's very important to keep a mill going—and a Trabon automatic lubrication system helps by delivering just the right amount of lubricant to each of the 4000 bearings in a typical mill at the right time. It does an absolutely foolproof job even when operating under dirt, steam, heat or any other rugged condition.

And all guesswork is eliminated, too. A single indicator at the pump tells you when each bearing has been properly lubricated.

Trabon systems, for oil or grease, have been delivering *positive* lubrication for over 25 years.

Write for more information today.

Trabon ENGINEERING CORPORATION
1814 E. 40th STREET • CLEVELAND 3, OHIO
Oil and Grease Systems

WHAT'S NEW IN MOTOR CONTROL? ★ ★ ★ GET IT FIRST IN CUTLER-HAMMER

Now industry's three-phase motors can have full three-phase protection with standard in-stock motor control!

Many motor users have proved *two* overload relays are no longer adequate protection for three-phase motors. In fact, motor burn-outs have become so widespread that Section 4327 of the National Electrical Code was recently amended. The code now permits authorities to *require* three overload relays in three-phase motor control . . . and this provision is already being enforced in some areas. Many safety experts and power engineers say the time is not far off when three-phase motor control with less than three overload relays will be unacceptable.

The use of three overload relays is not new. Many industrials plagued by recurring motor burn-outs and the resulting intolerable operating interruptions have changed to three-relay control. But such changeovers have been slow to effect and costly as no standard control was available with three overload relays. Special constructions and enclosures have always been required.

The BIG news today is that this is no longer true. The new Cutler-Hammer ★ ★ ★ Motor Control offers *three* overload relays in all standard starter constructions and enclosures. You pay only for the third relay, nothing additional for special engineering or manufacture. No extras. No delays. It is *in stock* at your nearby Cutler-Hammer Authorized Distributor. Order it today and use it tomorrow. CUTLER-HAMMER, Inc., 1325 St. Paul Avenue, Milwaukee 1, Wis.

CUTLER-HAMMER
★ ★ ★
MOTOR CONTROL
C-H

For designers of machines and special control panels

The unit panel construction of Cutler-Hammer ★ ★ ★ Motor Control makes it easy to incorporate starters with three overload relays. Starters mount in place with only three screws, require no more space than starters with only two overload relays. NEMA Sizes 0, 1 and 2 starters and all parts thereof are now available as components. Also a complete companion line of control relays with quickly interchangeable NC-NO contacts. Be sure you have the latest design data on this advanced equipment. Write or wire today.